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CONTRACTURES AND ALLIED CONDITIONS:

THEIR CAUSE AND TREATMENT.

BY

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THE deformities and disabilities that follow gunshot and other wounds form an interesting subject of investigation. Many of these are due to a contracted condition of the soft tissues, which obstructs the normal movement of the joints. Vague references to them as "cases of stiffened joints," or a general inclusion of all and sundry under the term "contracture" is a method of classification that is equally unscientific and unsatisfactory.

An attempt is made in this paper to elucidate some of the principles concerned in the production of these crippling conditions, and to outline the methods that may be adopted for their prevention and cure.

Passive resistance of a muscle to its normal elongation may be due to one or both of two causes: (1) The muscle may be in a state of contracture; (2) it may have undergone fibrotic changes. The two conditions are distinct, but a muscle may be the seat of both. Muscles are rarely affected singly, the distribution is generally synergic as regards definite movements—thus both pronators of the forearm are affected together and the involvement of the biceps generally determines that of the other flexors of the elbow also.

Restoration of normal passive movement to the joint is often rendered more difficult by the participation of the fibrous tissues controlling the joint in the morbid process, and there is evidence that in these cases relaxed ligaments tend to undergo definite contraction.

There seems to be ample ground for the opinion that the occurrence of contractures is relatively more common in military practice than was the case in the treatment of wounds and fractures in civil hospitals in peace time, and most surgeons in charge of military patients confess to finding it necessary to exercise the most constant care and supervision to prevent the development of these troublesome and deforming complications.

NATURE OF "CONTRACTURE."

It is necessary to make clear what is implied by the term contracture.

The word *Kontractur* was used by Hermann to describe the idiopathic state of contraction into which an excised muscle passes after it has been subjected to repeated stimulation. Under certain conditions a definite amount of residual contraction remains after each relaxation of the muscle, and if the muscle is made to contract several times in rapid succession the amount of this residual contraction is much greater and persists much longer. Finally, a condition of contraction can be produced which passes off very slowly indeed. A condition somewhat akin to this arises in muscles of the human body when under abnormal conditions they have been subjected to prolonged and excessive stimulation. As used at present, the word is of somewhat loose significance. It obviously should not be applied to muscles whose resistance to elongation is due to hypertonus; their state of contraction is in response to continuous stimulation, the result of increased innervation. It also should not be applied to muscles whose resistance to elongation is due to structural changes; such structural changes are essentially of a fibrotic character. Either the normal fibrous framework of the muscle has undergone contraction or fibrous tissue has been deposited in the muscle substance.

There remains, however, a definite class of cases to which the term "contracture" may legitimately be applied. These are muscles that have been subjected to an excessive and prolonged degree of stimulation, and it is found that many of these offer a resistance to their normal elongation which is unaffected by deep chloroform anaesthesia. Two explanations of this resistance can be offered: (1) It is due to a state of contraction in the muscle fibres; (2) it is due to fibrotic changes in the muscle structure.

If fibrotic changes can be excluded, then the resistance arises from the state of the muscle fibres. They offer resistance to normal elongation in virtue of the state of tension developed in them during the contractile process. Nothing short of section of the nerves to the muscle can exclude the possibility of stimuli reaching it and being the cause of the state of contraction in the muscle fibres; but if we take it that deep chloroform anaesthesia blocks all efferent stimuli, then the state of contraction of the muscle fibres must be of the residual type, and is closely allied to the condition of *Kontractur*.

The suggestion that has been offered that the muscle has undergone "structural shortening" in response to the prolonged state of contraction in which it has been maintained, must imply one or both of two things—either the fibrous framework of the muscle has adapted itself to the shortened condition of the muscle, and has undergone definite contraction, or the muscle fibres themselves are in a state of definite contraction. It will be seen that the first supposition comes under the head of fibrotic changes, and the second under residual contraction, or contracture.

Some reference to the contractile process is required in a consideration of these contracted conditions of muscles.

Various theories of the process of muscular contraction and relaxation have been advanced. The essential point in contraction is the development of a state of tension in the muscle fibre, and it has been shown that the energy developed is manifested as a surface phenomenon. During contraction lactic acid is formed, but there is no consumption of oxygen or evolution of CO_2. The restoration of this state of tension to the normal is accompanied by a process of oxidation, and the lactic acid disappears. There is considerable combustion of oxygen and production of CO_2. Fletcher and Hopkins[1] demonstrated in 1907, however, that the lactic acid did not disappear by oxidation, but that energy is restored to the system by the oxidation of carbohydrates. Hill expresses the matter by regarding the lactic acid as part of the machine but not of the fuel.

It will be seen that the lactic acid plays a very important part in the contractile process, but the nature of its action is not definitely understood.

Mines[2] considered the production of lactic acid as responsible for changes of surface energy, due possibly to its effect on the optimal hydrogen ion concentration for contractile response.

In the presence of oxygen the lactic acid tends to disappear, but its removal cannot be instantaneous; therefore, according to his view, a series of rapid stimuli may bring about a concentration of acid that is maximal, and so the muscle passes into "tetanus."

All authorities agree that during the process of contraction lactic acid is produced, and that during relaxation it disappears, and that its production is attended by an increase of tension in the muscle fibre, and its disappearance with restoration of the system to normal. In 1906 McDougall[3] published a theory of muscular contraction in which he conceived the state of tension developed during contraction to be due to interchange of fluid between the muscle fibrils and the surrounding sarcoplasm, such interchange being determined by the relative acidity of the two media. He regards the muscle fibre as consisting of a sarcolemma enclosing contractile substance—sarcoplasm—in which fibrils are embedded. The muscle fibril is conceived to be divided into segments by transversely placed membranes, the lateral walls of the segments are inextensible, so that increase of fluid contents leads to shortening of the segment and of the fibril as a whole. A nerve impulse is followed by the production of lactic acid in the fibril, fluid passes in from the surrounding sarcoplasm, and the tension developed results in shortening of the fibril. The lactic acid tends to disappear in the presence of oxygen—he suggests that it is neutralized by an alkaline substance inherent in the sarcoplasm—and its disappearance is followed by return of the fluid absorbed and the restoration of the normal tension within the muscle fibril.

If the nerve impulses are continuous, a stage will be reached when the neutralizing substance will become exhausted and a concentration of lactic acid will result within the fibril, and consequently the absorbed fluid will be retained; the muscle will therefore remain in a state of prolonged contraction or *Kontractur*, and this will persist so long as the contents of the fibril remain acid.

Whatever explanation is advanced of the highly complicated changes that occur during the contractile process,

the part played by lactic acid in the production and maintenance of a state of tension is generally recognized, and therefore it is reasonable to assume that every factor that tends to maintain an acid condition of the sarcoplasm may be regarded as a factor in the maintenance of the state of contracture.

The production of rigor mortis appears to have some features in common with that of contracture. It is distinctly suggestive that in animals hunted to death, and in those persons who have undergone severe muscular exertion before death the onset of rigor mortis is very rapid.

The possible explanation of this fact is that the excessive oxidation going on in the system leads to a local deficiency in the supply of oxygen to the muscular tissues; therefore lactic acid tends to accumulate, and at the moment of death there is an excess of acid present.

The onset of somatic death and the failure of the general circulation stop any further supply of oxygen to the tissues. Molecular life, however, persists for some time after somatic death; and the formation of lactic acid in a dying muscle is a matter of common observation. This lactic acid would determine an increase of tension in the muscle fibre, and in the absence of a supply of oxygen this state of tension would persist. Rigor mortis would therefore be of more rapid onset in muscles exhausted by prolonged activity than in those not laden with lactic acid at the moment of death.

Some light may be thrown on the consideration of the state of contracture by a reference to the interesting phenomenon of the "catch" mechanism that is met with in some varieties of smooth muscles. Von Uexküll's[4] description of a typical instance of its action may be quoted:

"If one takes a normal Pecten out of the water it gives two or three flaps with its shells before permanently closing them. While it is open, a piece of wood is pushed between the shells, which then close and hit upon the wood with so powerful a crash that their edges are splintered. The wood is then held as in a vice. One can, however, pull it out by twisting it about backwards and forwards, and then one is surprised to see that the shells remain motionless, just as would the jaws of a vice if an object clamped between them had been forced out.

"The shell movement shows not the least degree of elasticity. The muscular fibres seem to have been frozen solid. If one next tries to *open* the shell no effect can be produced, but even the pressure of a finger is sufficient to press them nearer together, and in this position they remain fixed again so that they cannot be brought back."

The action is analogous to a simple mechanical ratchet action.

The "catch" in the muscle has been shown to be put into action by one set of nerve impulses (excitatory), and removed by the intervention of another (inhibitory). A similar condition is met with in the urinary bladder of mammals, and possibly also in the muscular coat of the arterioles.

According to Bayliss[5] the actual mechanism may possibly consist in the prevention of the spontaneous disappearance of the lactic acid produced by stimulation of the muscle.

These three conditions—contracture, rigor mortis, and "catch" mechanism—illustrate states of muscle contraction maintained without nervous stimulation, and, as has been demonstrated, it seems clear that the essential factor which they all three have in common is the accumulation of lactic acid within the muscle fibre, and this, as we have seen, is inseparably associated with the development of a state of tension therein.

Production of Contracture.

The production of contractures is favoured by several factors:

I. Immobilization of joints in a flexed position for continuous periods places the flexors of such joints in a position of prolonged contraction. This positional response is somewhat similar to the "plastic tonus" described by Sherrington.[6] He has shown that in the decerebrate animal a limb will remain fixed in the position to which it is moved. This phenomenon is due to reflex tonicity from afferent impulses arising within the muscles themselves, and it would appear that each particular length of the muscle is able to set up afferent impulses of such a degree that the resulting afferent response is sufficient to maintain the muscle at that level. Afferent impulses arise from the proprioceptors of a muscle, and in the reflex contraction of plastic tonus the muscle calls forth the necessary afferent impulse by the degree of stimulation it imparts to the proprioceptors. This illustration of plastic tonus applies to the condition we are considering, since the fixation of the joint renders the degree of contraction in the affected muscles almost a purely reflex phenomenon. The placing of a muscle in a position of contraction results in the muscle accommodating itself to this condition; an increased stream of afferent impulses calls forth corresponding afferent response, and the principle of "reciprocal innervation" leads to inhibition of its antagonists (McDougall). The consequence is that the flexors are subjected to a prolonged degree of stimulation, which maintains them in a state of contraction, and, as has been shown, it is this prolonged stimulation that leads to the production of contractures.

II. There is strong evidence that many of these cases of prolonged contraction are really cases of localized tetanus poisoning. It will be recalled that one of the earliest symptoms of the onset of acute tetanus is the increased irritability of the muscles in the neighbourhood of the wound, and, moreover, it has been found that 15 per cent. of septic wounds examined contain a virulent strain of the *Bacillus tetani*. The muscles which are the seat of the infection, and from which the virus travels up the nerve, would naturally be the first to experience the responsive efferent impulses from the anterior horn cells, and if the virus does not spread in the cord one can readily conceive a state of prolonged contraction confined to the muscles in the neighbourhood of the wound. Contractures and myofibrotic conditions, following prolonged tetanic contraction in cases of acute tetanus differ only in degree from those arising in cases not obviously the subject of tetanus poisoning. They are generally much more severe, and it is clear that, as in the case of immobilized joints, the excessive stimulation of the muscle is the essential cause of the condition.

III. The presence of local and general sepsis has probably an important effect in the production of contractures and myofibrotic conditions. Lymph streams leading from a septic focus will be charged with toxic products, and these cannot be without effect on the cells with which they come in contact. The nature of the cell membrane and the conditions that determine interchange between the cell and the surrounding lymph are still very obscure. It is known, however, that substances that render the membrane more permeable increase the excitability of the cell, and similarly, when a cell is in a condition of stimulation, it is more permeable to certain substances.[7]

The muscular tissue in the vicinity of a wound generally exhibits a somewhat more excitable condition than normal (defensive spasm), unless there is profound toxaemia present, when the reverse is the case. This increased excitability may not be wholly reflex, but may possibly be due to a permeable effect of the septic products on the cell membrane, and, if so, it is reasonable to suggest that we may here have a factor in the readiness to pass into a state of strong contraction, which muscles fixed in a position of contraction so frequently exhibit. Many muscles so affected are exposed to the effects of lymph streams which must be laden with toxic products. It is established, however, that if the lymph-borne products are highly toxic, the cell is permanently damaged, and fibrotic changes ensue. Under these conditions a definite myofibrosis takes place, with progressive shortening of the muscle as a whole.

Stages of Contracture.

Muscles that passively resist their normal elongation fall into three groups: (1) Muscles that are in a state of pure contracture; (2) muscles in a state of contracture, with myofibrosis supervening; (3) muscles that have undergone fibrotic changes without antecedent contracture.

Muscles in Pure Contracture.

The first group is typically represented in lesions of the upper motor neurone. In ordinary capsular lesions the flexors of the upper and the extensors of the lower limb show a condition of hypertonus. This hypertonus must obviously be due to an increased flow of efferent stimuli to these muscles.

Sherrington[8] has shown the important part played by afferent impulses in the maintenance of muscle tone, and he regards the tonic contraction of the extensor muscles which enables a decerebrate animal to maintain a standing attitude, as an expression of reflex postural activity. He has demonstrated, moreover, that the essential afferent impulses that maintain tonic postural contraction in the extensors of the lower limb arise within the muscle itself, for the reflex tone is fully maintained even when all the skin nerves of both lower limbs and the nerves from all the other muscles of the limbs have been severed, and the tonus only vanishes when the afferent nerves from the muscle itself are divided.

These afferent impulses, on which the reflex tone of a muscle depends, pass into the cord via the posterior nerve roots and are conducted by various paths to different centres.

It may be assumed that the anterior horn cells are extremely sensitive and responsive to afferent impulses, and that they are protected from these afferent impulses by a series of synapses, part of whose function is to act as a resistance and to prevent the full force of the afferent impulse reaching them (McDougall). Moreover, there is evidence to show that in the reflex arc each afferent nerve fibre divides into two parts in the spinal cord; one division is excitatory and the other inhibitory in respect of motor neurones.

Certain poisons—strychnine and the toxin generated by the *Bacillus tetani*—have been shown by Sherrington to have a reversal effect on the inhibitory termination of the afferent fibre, and their action converts the process of inhibition into the one of excitation. It is probable also that these poisons lower the threshold of resistance at the synapses referred to above, and as a consequence a larger measure of the afferent impulse passes to the horn cells, and there is a correspondingly stronger efferent impulse transmitted to the muscle concerned. Hence the extremely powerful reflex contractions produced in these cases by very slight stimuli, such as moderate noises and movements of the bedclothes.

Normally, the afferent impulses are diverted along various paths, and only a portion of their influence is expended in the cells of the anterior horn. A considerable part of the sensory impulse passes up to the cerebral centres, where the response is to some extent under the control of the volition.

A series of experiments—Graham, Brown, and Sherrington[9]—have shown that inhibition is a more prominent reaction of the cortex than is excitation, and it would seem that one of the special functions of the cortex is to reverse the factors of purely spinal or decerebrate reflexes when necessary.

The demonstration of this fact serves to explain what is meant by "higher control" of the reflex response, and it would account for the hypertonicity of certain groups of muscles in lesions of the upper motor neurone.

In the latter conditions, the inhibitory influence of the cortex being removed, there is a correspondingly uncontrolled reflex response from the anterior cells, and the muscles concerned pass into a state of hypertonus.

In the upper limb the flexors naturally gain an early ascendancy over the extensors as they are more strongly developed, and, moreover, they have a postural advantage. They soon pass from a state of reflex tone to a state of reflex contraction—that is, they undergo shortening, and act on the joint concerned.

Once they assume the condition of definite contraction, the stream of afferent impulses from the contracted muscles is intensified, and there is a corresponding increased efferent response from the reflex centre. At the same time the afferent impulses from their antagonists have their efferent response inhibited, or most probably reversed to act on the flexors, and so what was at first a condition of increased tonus passes gradually into a condition of definite reflex contraction.

Reflex phenomena in lesions of the upper motor neurone vary according to the paths that are interrupted. Walshe[10] has shown that there are two centres for reflex contraction—one, which is paracerebellar in situation, controls extensor groups only; the other, situated in the anterior horn, controls both flexor and extensor groups. The extensors are thus seen to have a double innervation.

In hemiplegia, contracture in extension in the lower limbs is the rule, and contracture in flexion is only produced when the extra-pyramidal path that connects the paracerebellar extensor centre with the extensor neurone in the anterior horn has been severed.

Then the paracerebellar extensor centre is cut off and the extensors are left dependent on the spinal reflex centre which is only partially responsible for maintaining the reflex tone of the extensor muscles. Thus, severe injuries of the cord are generally attended with flaccidity of the extensors, or with actual hypertonicity of the flexor groups.

This group of muscles in a state of pure contracture embraces, however, a much wider range of cases than those produced by lesions of the upper neurone. It includes all those flexor groups that, placed in a position of prolonged contraction by immobilization of a joint, tend to pass into a state of contracture. These have already been considered and need not be alluded to further. The muscles most frequently affected in this manner are the biceps, brachialis anticus, pronators of the forearm, and the pectoral muscles.

There is, however, an interesting condition that may be referred to here. Amputations below the knee are frequently followed by spasmodic contraction of the hamstrings and amputations through the thigh by contraction of the ilio-psoas muscles. This contraction is due to irritation of the nerve stumps, and is obviously a defensive reflex, the effect of irritation of the nerve stumps being equivalent to painful stimulation of the tissues they supplied, with the consequent reflex withdrawal of the limb.

Muscles with Commencing Fibrosis.

The *second group* of muscles includes those muscles in a state of contracture in which fibrotic changes have supervened. Practically all the muscles belonging to the first group tend to pass into this condition. There is no degeneration of the muscle fibres, but the fibrous framework of the muscle has adapted itself to the prolonged state of shortening of the muscle, and it has undergone definite contraction. Microscopic examination of small portions of the muscle in such cases reveals no abnormality.

Fibrosis without Preceding Contracture.

The *third group* includes all those muscles which have undergone fibrotic changes without antecedent contracture. It includes both flexors and extensors. Such muscles have been the seat of inflammatory disturbance affecting them in whole or in part. There may have been direct trauma of the muscle, or it may have been involved in the products from a neighbouring area of inflammation.

A diffuse scar is formed where the muscle tissue has undergone degeneration, and this scar tissue often extends into and fixes the muscle to surrounding structures, thereby limiting its range of action more effectively. The muscle as a whole may have undergone fibrotic changes following degeneration of the muscle fibres, due either to the action of toxins or to prolonged strangulation, as in ischaemic contraction.

Microscopic examination in these cases, in the earlier stages, reveals the presence of numerous fibroplastic cells infiltrating the muscle fibres, and in the later stages fully-formed fibrous tissue is seen replacing and strangulating the contractile tissue and the blood vessels.

In the normal muscle the fibrous framework is adapted to the degree of complete normal elongation of the muscle, to which it offers no resistance, but pathological fibrous tissue formed while the muscle is not fully extended will, since it is practically non-elastic, obstruct its normal elongation, and will therefore limit the degree of movement at the joint which the muscle controls.

Allied to the condition of contracture, also, is the tendency of ligaments under similar conditions to undergo definite contraction, thus offering further obstruction to the normal free movement of the joint. The anterior ligament of the elbow-joint has frequently been seen to be involved, but the ligaments most commonly affected are the posterior ligaments of the metacarpo-phalangeal joints.

TREATMENT.

The discussion of the treatment of contractures and myofibrotic conditions falls under two heads—preventive and curative. The essence of preventive treatment is to deal with the cause. The principal factor in the production

of contractures has been shown to be prolonged and excessive reflex stimulation of the muscles concerned. and myofibrosis has been seen to arise as a result of degeneration or destruction of the muscular tissues. "Keep diseased parts at rest" is a doctrine enjoined both by Nature and by Abernethy, and Nature endeavours to secure this rest by immobilizing the neighbouring joints. She achieves this by establishing hypertonicity of certain muscle groups (defensive spasm) and in some cases by creating a functional paralysis of others. If a joint in the vicinity of an injury is artificially fixed in a position of flexion, she acquiesces in the arrangement by throwing the muscles thus placed in a position of contraction into a state of hypertonicity.

This employment of muscles as splints frequently results, as has been seen, in serious damage to their structure and function, but it is obvious that immobilization of the neighbouring joint is necessary, if rest for the injured tissues is to be secured, and it is not possible to circumvent the methods adopted to secure it without interfering with the process of repair. Direct treatment of the cause of contractures is therefore necessarily somewhat limited, and in many cases it is best directed along lines that aim at hastening repair, and so bring about the release of the contracted tissues at the earliest moment.

Passive and active movements should be undertaken as soon as is consistent with the state of the injured tissues, but the surgeon has to balance the question of repair against the preservation of the function of the other structures of the limb, and it is frequently very difficult to decide the rival claims.

As a general rule, however, it will be found that, as regards the condition of the soft tissues, the ultimate results will be much better if the limb is treated in a position of extension, rather than flexion, as it proves to be much easier to overcome resistance arising in the extensor than in the flexor groups.

Where hypertonicity of muscle groups is due to the toxins generated by the *Bacillus tetani*, the obvious line of preventive treatment would appear to be more effective administration of antitetanus serum, and it will be interesting to observe if the recent order from head quarters that every patient with unhealed wounds is to be injected with antitetanus serum weekly, will have any effect in reducing the percentage of contractures that has been so far experienced. Once a persistent state of hypertonicity due to *Bacillus tetani* toxin has been established, attempts to prevent the formation of contracture by moving or fixing the joint will only result in increased reflex contraction, and we must wait until the action of the toxin has largely declined before encouraging restoration of function to the muscle affected.

Where hypertonicity follows lesions of the upper motor neurone there is seldom any direct treatment of the cause possible beyond surgical relief of external pressure where that factor is concerned in the production of the lesion.

An attempt may be made, however, to prevent the hypertonic muscles passing into a condition of contracture, and subsequent fibrosis, by systematic massage and by gentle movements of the joints. The condition is amenable to preventive treatment in this respect—that the greater the degree of contraction that the muscles are allowed to assume the more marked in proportion will be the reflex efferent response.

The value of splints in controlling the action of hypertonic groups in certain cases is obvious. Thus, in hypertonicity of the tendo Achillis group, the ankle-joint should be fixed by suitable apparatus, and if the contraction of the flexors in the upper limb threatens to bring about a condition of passive resistance in these muscles, suitable means for maintaining extension of the joint should be devised.

The prevention, and control, of fibrotic changes in muscles depends on the origin of the toxin that gives rise to the degenerative changes in the muscle fibre.

If the degeneration appears to be due to faulty excretion of the products of metabolism, then the obvious line of treatment is to restore the function of the muscle as soon as possible, and in the meantime to promote the health of the muscle tissue by massage, and by movements where possible. If the degeneration of the muscle, however, is due to toxins of microbic origin, the surgeon will naturally be concerned at first with dealing with the septic process, and will postpone any manipulation until he is satisfied that the danger of extending the field of sepsis is past. It is apparent that serious harm will be done to the muscle cells if artificial stimulation is used to promote interchange between these and toxic-laden lymph channels.

If it is considered probable that a muscle will be the seat of fibrotic deposit, it is advisable, if other considerations permit of it, to place the limb so that the affected muscle will be as fully stretched as possible while healing.

Similarly, if flexor groups are likely to be the seat of scar tissue formation, the limb should be treated in a position of rest until the cicatricial elements have been laid down. Then it should gradually be brought into a position of full extension, and kept in that position until the wound is fully healed and hyperaemia of the scar has disappeared. During the healing process excessive granulations should be pruned down, as they promote the formation of fibrous tissue elements. As a general rule, wounds of the palm of the hand and front of the wrist should be allowed to heal with the fingers and hand in hyperextension; wounds near the flexure of the forearm with the forearm in extension; wounds of the pectoral muscle with the arm abducted, and so on (Jones).[11]

In view of the theory promoted that the condition of contracture is maintained by the persistence of lactic acid in the contractile substance, attempts to neutralize the acid by an alkaline agent were carried out.

The serious obstacle to testing the value of this line of treatment, however, was the difficulty of bringing the neutralizing agent into contact with the contractile substance. Attempts were made to flood the local capillary lymph system with solutions of sodium bicarbonate and sodium citrate, but they were not very successful. Moreover, it is very probable that the cell membrane becomes impermeable after prolonged contraction of the muscle fibre.

While experiments have shown that a short stage of excitation of the cell results in increased permeability of the cell membrane, the fact that continuation of a state of tension depends on the persistence of lactic acid within the cell would go to show that prolonged contraction brings about a state of impermeability of the membrane.

Crude attempts were made to introduce weak alkaline solutions by numerous injections into the belly of the muscle, and there is no doubt that the effect was so far favourable that a definite increase in elongation was obtained shortly afterwards. The introduction of hydroxyl ions was found to be limited in action by the readiness of these ions to combine before reaching the muscle cells. The method, however, offers a field for further experiment.

Curative Measures.

Curative measures may be divided into surgical and non-surgical. While the great majority of contracted conditions will yield to manipulation under appropriate conditions, there will remain a proportion of cases that obstinately resist every effort at extension. Indiscriminate tenotomy is, of course, to be condemned, but in some cases it is the only resource. This is especially the case where the powerful muscles of the calf are concerned; a Z-shaped tenotomy of the tendo Achillis will effect an artificial lengthening of the tendon and will enable the deformity of the foot to be corrected. A suitable fixation during healing is obtained by plaster-of-Paris, and at an early date active and passive movements of the joint are undertaken.

Non-surgical measures include (1) methods that aim at the restoration of metabolic activity in the affected tissues, and (2) movements of the joint designed to overcome the resistance to its range of action. Both active and passive movements of the joint should be employed for this purpose. The former are naturally restricted by the degree of contraction present, and success will most quickly be achieved by the exercise of the latter method.

Passive movements should be of a steady and prolonged character; spasmodic and violent efforts only irritate or rupture the tissues, and attempts at stretching under an anaesthetic fail, as a rule, to effect much improvement, because considerable force is apt to be employed, the tissues are ruptured rather than stretched, pain delays manipulation for several days following, and effusion promotes further fibrous changes. It is generally agreed that

some form of preparatory treatment prior to manipulation of the tissues is desirable, and experience has shown that heating the affected part is the most valuable method of preparation. In a fibrosed muscle the effect of the pathological fibrous tissue is constriction of the muscle fibres and strangulation of the blood vessels, with consequent exsanguination of the muscle.

A rise of temperature is followed by dilatation of the vessels and an increased flow of blood; the fibrous tissue elements are opened up and metabolism promoted. Methods of heating may be classed as wet and dry. Of wet methods there are the ordinary still water baths and the recently-introduced whirlpool baths.

The *eau courante* has been adopted in this country in view of the excellent reports made by the French regarding its efficiency. Its superiority over immersion in a stagnant bath is apparent. The temperature registered by thermometer in a bath of still water is much higher than that to which the limb immersed is actually subjected. The skin is protected in a bath by a thin gaseous film—either adherent air or CO_2 given off from the pores. The buffer effect of this film to the passage of heat, is further increased by the fact that the layer of water immediately surrounding the limb is of a temperature intermediate between that of the tissues and the water—heat passing through fluids by convection, not by conduction.

With the water of the bath in a state of constant motion, however, the protective layers surrounding the limb are swept away, and the limb is more approximately subjected to the actual temperature of the bath. It is claimed that a massage effect is obtained in these baths, and air under pressure is introduced in order to heighten the result. There is no doubt that the sensory nerves of the skin are stimulated by these means and that the superficial tissues are reflexly affected, but reflex action in muscles is mostly in response to afferent stimuli arising in the muscles themselves and the number of "skin reflexes" is comparatively small. It is the deep structures that are concerned in most of these disabilities, and they appear to benefit by the *heat* imparted to them; it is not apparent that they can be influenced materially by the massage action of the water. As many of the cases treated are complicated by a degree of functional paralysis, the spectacular effect produced by the introduction of compressed air into these baths must have a certain psychical effect.

Reports from centres in this country where the whirlpool baths have been established are all unanimous that a great economy is effected by their use, and that in a short period they more than repay their cost. Modifications of the method will come with further experience—for example, a rhythmically interrupted sinusoidal current passed through the bath whilst the water is in motion will be found to be much more effective both physically and psychically than the action of compressed air, but there is no reason why the beneficial effects of moving water, wave current, and rushing air should not all be combined in one application.

Baths of hot wax have been advocated by some authorities as a means of imparting high degrees of heat to a limb. Very high temperatures have been employed in this manner, but it is apparent that the tissues are not subjected to the temperature at which the wax stands. They are undoubtedly insulated by the protective layer of air which the limb carries into the bath—an explanation similar to that given of the fact that one can with impunity plunge one's arm into a mass of molten metal.

Of dry methods of imparting heat to the tissues there are the various forms of radiant heat, dry air, hot sand, and diathermy. Radiant heat has many advocates, and there is no doubt that it is an efficient form of treatment. Hot sand has been recommended as a useful method of imparting heat to the tissues. It is, however, rather painful, and the skin is found to have been rendered much too tender for subsequent massage. It has no advantages over other methods, and is but seldom employed.

Of all methods of heating the tissues, however, the most scientific and effective is by diathermy, and its advantages are not approached by any other method designed for the production and application of heat. As is well known, it is a modification of the high-frequency current (the ampèrage is much higher and the voltage much lower). Heat is produced in the part solely by the amount of current which passes through it, the enormous frequency of the oscillations of the current making it possible to transmit large amounts of current without injury to the tissues. The advantage of producing heat in the deep structures themselves is obvious. Heat applied to the skin brings about a dilatation of the peripheral vessels and a flow of blood to the surface. A great part of the heat so applied must therefore be carried away at once into the general circulation, and the condition of the superficial tissues after the treatment cannot give any reliable indication of the state of the underlying muscles and ligaments. With diathermy, however, the skin is not unduly heated, and experiments show that heat is produced uniformly in the path of the current. Moreover, the oscillations of the current are known to have a marked effect on lymphatic absorption, and pain and swelling are observed to disappear rapidly under its action.

One disadvantage of diathermy is that it is not so easy to treat so large an area of the limb as is possible with the whirlpool baths. On the other hand, many parts of the body are more accessible to treatment by diathermy than by baths—for example, the muscles of the neck, shoulder, arm, and thigh.

Whatever system of preliminary treatment is adopted, it is followed by some form of manipulation. Of massage it is sufficient to say that by direct stimulation of the muscle fibres it aims at re-establishing the normal interchange between the muscle plasma and the lymph stream. Direct stimulation of the muscle by this means is attended by various reflex phenomena; increased efferent impulses temporarily restore the muscle tone, and vasomotor dilatation is followed by a local fall in blood pressure.

Following massage, contracted tissues should be subjected to periods of prolonged and steady traction. In the intervals active movements of the joints should be encouraged if the condition of the limb permits.

Contracted conditions of the tissues are most commonly met with in the upper limb. When the flexors of the wrist and fingers are involved, the method described by Robert Jones [11] will be found most effective.

The wrist is flexed to permit extension of the fingers, each finger is then strapped to a gutter-shaped splint to maintain it in extension. A day or two later, according to the progress made, the metacarpo-phalangeal joint is extended and the palm and splinted fingers are bandaged to a flat metal splint. The wrist remains flexed for a day or two, and then by means of a splint it is each day gradually extended until finally it is brought into a position of hyperextension. The splints should be removed each day, and tone and nutrition maintained by a period of gentle stimulation.

A much more troublesome condition to treat is that in which passive flexion of the fingers is prevented by a contracted condition of the posterior ligament of the metacarpo-phalangeal joint. These cases have arisen by maintaining the hand and fingers in a position of extension for a prolonged period. Occasionally when there has been direct involvement of the extensor tendons as a result of trauma or sepsis, the nature of the resistance is clear, but in many cases it is probable that several structures are concerned in the fibrotic shortening. In severe cases not much is gained by attempting to overcome this condition by forcibly flexing the fingers under an anaesthetic; this generally results in effusion, pain, and a more intractable resistance to further flexion.

By the use of a metal splint similar to that introduced by Robert Jones for maintaining extension of the wrist in musculo-spiral paralysis, continuous traction can be applied, first at the interphalangeal joints and then at the metacarpo-phalangeal joints. This splint consists of a metal stem applied to the front of the forearm and hand, with cross-bars partially embracing the wrist and palm. When bandaged to the forearm, the splint holds the hand in a position of hyperextension.

Small loops of zinc oxide strapping, with a cord attached to each, are passed over the middle phalanx of each finger. The cords are brought round the cross-bar which has been left exposed in front of the wrist, the phalangeal joints are flexed as far as possible, and the cords made fast. A few hours generally suffice to overcome the resistance at these joints, and after treatment with heat, massage, etc., the loops are slipped over the first phalanges and the metacarpo-phalangeal joints flexed to the fullest possible extent and tied down as before. As a rule, it is not advisable to maintain this position for more than six hours at a time.

The splint should then be removed, the hand should be heated, and active and passive movements of the joints carried out. The actual gain from day to day may be very small, but excellent results can generally be achieved if the treatment is persisted in. For the treatment of contracted conditions of the flexors of the forearm several methods of applying continuous traction are available. Splints with springs or elastic accumulators applied to the posterior aspect of the limb are, on the whole, rather unsatisfactory. The plan of tying weights to the forearm may be of some effect, but it does not commend itself to the patient.

The best results are obtained by placing the patient on his back on an ordinary massage couch. His shoulder and chest are fixed to the couch by adjustable strappings. A firm pad is placed under the flexed elbow, and traction is applied in the line of the arm by attaching a strong cord to the wrist, passing it over a pulley at the bottom of the couch, and fastening it below. After five or ten minutes the cord becomes noticeably slack as the flexion yields, and it requires to be tightened up at intervals. Cases steadily improve if this treatment is carried out for periods of an hour twice a day. The pectoral muscles can be stretched in similar fashion by tying the extended arm back to some object in the room, the weight of the limb being sustained by a small table placed under the forearm.

The Zander system provides an excellent method for the exercise of both passive and active movements. The machines can be adjusted, either passively to stretch contracted tissues or to provide a resistance against which the muscles are encouraged to contract. The action is a rhythmical one, and its value lies in the fact that the force is evenly exerted without sudden jar or strain; this is effected by an adjustable system of counterpoise, the action of which resembles in some measure the steadying and controlling effect exercised by antagonistic muscles during the contraction of their opponents. The Zander machines are expensive, but where large numbers of cases are treated they very soon repay their cost.

Whatever line of treatment is adopted, restoration of function and voluntary exercise of the affected limb should be encouraged from the earliest possible moment; and interference with the function of the muscles concerned should be as limited as is consistent with the treatment being carried out.

I am obliged to Colonel T. Lucas, C.B., for his kind permission to publish this paper.

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Lectures

ON

DISEASES OF THE MALE URETHRA.

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LECTURE III.—COMMON METHODS OF EXAMINATION AND TREATMENT (*continued*).

MASSAGE OF THE PROSTATE.

INSERT a gloved finger into the rectum. The prostate may be felt to be swollen, hot, and tender, or its outline may be lost and nothing be felt but a large smooth projecting abscess. If it is too tender, no further examination should be made, but if not, make gentle pressure with the finger from the outer limits of the swelling forwards and inwards towards the urethra. After a certain number of such squeezings, it will be found that a drop or more of purulent or opalescent fluid has appeared at the meatus. This is prostatic fluid. If needed for examination, it is caught on a microscopic slide, spread out as a film, fixed by gentle heat, stained with methylene blue, washed, dried, covered with cedar oil, and inspected with a $\frac{1}{12}$ in. oil immersion lens.

Healthy prostatic fluid consists of little else but droplets of fat (lecithin) suspended in a clear fluid. These are seen in the film as blue amorphous particles of varying sizes. Here and there an epithelial cell may be seen, but pus cells are remarkable by their absence. In prostatitis the film of prostatic fluid contains a large number of pus cells. This is the diagnostic feature. It is uncommon to find either gonococci or other bacteria in a stained film unless the examination be made as the acute stage is coming to an end, and it is usually only possible to isolate the bacteria by special stains or by culture on suitable media.

I cannot too emphatically warn you to use only the greatest gentleness in this procedure. The process is one of "peaceful persuasion." A heavy hand is not needed. If too great force is used the rectal mucous membrane may be torn, which will cause a fissure *in ano* and even ischio-rectal abscess. I have never seen this in my own practice, but cases have been brought to my notice with these sequelae in which too great force has been used, the operator not having realized that great force is not required. Again, there is the risk of setting up epididymitis if force is used. The process should only last one or two minutes, and the object has been obtained if a drop or two of fluid can be seen exuding from the meatus. Cure attends gentle methods.

By thus emptying the prostate not only do you remove some of the infected contents, but you open up also the blocked ducts, so that drainage is improved. You also ensure that fresh fluid from the blood vessels enters the prostatic tubules ("Nature's antiseptic fluid"), and probably you liberate a certain amount of gonococcal endotoxin, and produce an autovaccination of the patient with his own vaccine from his own germ as it lives in the tissues.

As a general rule prostatic massage should not be carried out more than every fourth or fifth day, and in many cases once a week is enough, or even once a fortnight. In chronic cases give a course of prostatic massage every fourth or fifth day for four weeks. Then give the parts a rest, and if possible get the patient away to the seaside. After a rest of two or three weeks test the fluid microscopically, and if not yet healthy institute another course of some weeks' duration. It is a great mistake to go on too long without a period of rest.

Indications for Prostatic Massage.

1. As a diagnostic measure in subacute or chronic cases, to obtain a specimen of fluid for microscopic examination.
2. In subacute cases every second or third day, to secure the subsidence of the swelling, and drainage of the glandular tissue.
3. In chronic cases every fourth or fifth day to secure drainage and autoinoculation.
4. In acute cases never except under two conditions—first, when there is retention of urine, to secure rupture of an abscess into the deep urethra; secondly, in joint cases, to empty the blocked vesiculae and prevent further absorption of gonococci into the circulation.

LUBRICANTS.

The ideal lubricant is one soluble in water that contains no oil or fat, that is strongly antiseptic, non-irritating, and always ready for use.

The objection to oily lubricants sterilized by heat is not that they are not sterile, but that they coat instruments and the urethra with a film of fat. A film of oil makes it more difficult to cleanse the surface of an instrument, and prevents formaline vapour from acting efficiently as a sterilizing agent on the surface of an instrument. Again, a urethra coated with oil cannot benefit from lavage by antiseptic fluids. I have abolished all oily lubricants from my clinic, as there is no need for them.

The ideal lubricant consists of sterilized glycerine 20 parts, tragacanth 2 parts, oxycyanide of mercury $\frac{1}{4}$ part, sterilized distilled water 100 parts. This formula we owe to Casper of Berlin, and it has been widely copied as the K.Y. lubricant, or as Lubrifax by Burroughs and Wellcome. It is put up in tin squeezer tubes with a screw top, and is thus portable and always ready for use. It is sterile and antiseptic, is a good lubricant, is transparent enough for cystoscopic use, and is soluble in water.

How to Anaesthetize the Urethra.

The best drugs are stovaine 4 per cent. or novocain nitrate 4 per cent. in sterilized distilled water. Cocaine should never, on any pretence whatever, be used in the urethra. Cases of death from this practice have actually been reported in the literature, but far more deaths have occurred which have not been reported. One half a grain of cocaine placed in the deep urethra is more than likely to kill a patient. Be wise, then, and do not permit any cocaine in the clinic. Otherwise you will be tempted to use it, and afterwards have cause for regret.

Novocain and stovaine are ten times less toxic than cocaine, and nearly as powerful analgesics. Their solutions can be sterilized by heat. There is no need to add adrenalin. Three to four drachms of a 4 per cent. solution of these drugs can be used with safety. In practice less than a drachm usually suffices, and as the solutions are expensive they should be used sparingly.

How to anaesthetize the anterior urethra: Suck up a drachm of 4 per cent. stovaine solution into a boiled stylo filler. Inject this into the urethra, and get the patient to hold it for some minutes by grasping the penis behind the glands with the thumb and forefinger.

How to anaesthetize the deep urethra: Suck up a drachm of 4 per cent. stovaine solution into an Ultzmann's syringe and catheter, lubricate and pass the catheter into the deep urethra. Press home the piston and withdraw the instrument. You can tell exactly when your catheter enters the deep urethra, as you can feel the tip ride through the resistance of the compressor urethrae muscle.

Ultzmann's Syringe.

This consists of a curved metal catheter with a very small central bore, to which can be attached a small syringe. Fill the syringe with silver nitrate solution, one, five, ten, fifteen, or twenty grains to the ounce of distilled water. Attach the syringe to the catheter, lubricate, pass into the urethra until the catheter is felt to pass through the resistance of the compressor urethrae muscle. Inject the contents of the syringe, so that they fall into the deep urethra. Remove the catheter. After a few minutes ask the patient to pass water. Warn him that this will cause an intense burning sensation and that he will experience this for some hours after. If this is very severe, let him sit in a hot bath for relief.

Indications.—This method of treatment is of great value in the last stages of the disease, when there is simply a clear urine, with a few threads and a moderate amount of pus in the prostatic secretion. Start with the lowest strength and work up to the highest strength. Never use these injections more than once or twice a week. Copper sulphate 4 per cent. in glycerine can be used as a useful variant on these silver preparations, especially in cases where silver is found to irritate. Some patients have an idiosyncrasy against silver.

Warning.—Use the Ultzmann pattern of catheter, as it can be boiled and is easily passed. Do not use the fashionable Guyon syringe and acorn-headed gum elastic catheter. The latter cannot be boiled, and is therefore an undesirable possession. Only the Ultzmann catheter need be boiled. The syringe should be kept in weak lysol solution. The piston will need renewal from time to time. When it is desired to anaesthetize the deep urethra prior to cystoscopy or deep urethroscopy the ideal method is to inject one drachm of 4 per cent. stovaine solution into the deep urethra with the Ultzmann syringe.

Urethral Instruments: Bougies, Catheters, and Dilators.

Instrumentation.

In this connexion a complete revolution of method has taken place in the last ten years. The normal urethra swarms with bacteria in its first inch or so, but higher up it is sterile. It has been proved that it is quite possible to sterilize the urethra for a short time by means of antiseptic washes. If this is not done before instrumentation, bacteria will be pushed up by the instrument and planted in the deep urethra and bladder. It may therefore be laid down as an absolute rule of practice that no instrument should be passed up the urethra until the anterior urethra has been well flushed with an antiseptic lotion.* The best antiseptic wash is oxycyanide of mercury 1 part in 4,000 of water, but if that cannot be obtained boracic lotion or lysol 1 drachm to the pint of water may be used. The wash is made up in a douche tin or bag and suspended three to four feet above the level of the patient's urethra. To the tubing of the douche tin is attached a urethral nozzle and shield. A pint or more of the wash is allowed to flow into the urethra through the nozzle up against the compressor urethrae, whence it rushes back again and out around the mouth of the nozzle, which is not allowed to block the urethra completely. The hands of the operator must also be cleansed with soap and water, and the meatus and the glans penis cleansed with the irrigating lotion.

All urethral instruments will withstand sterilization by heat except those made of gum-elastic. Modern gum-elastic instruments will however withstand boiling water for a time, so that in emergency the practitioner is advised always to boil his instruments.

Bougies.

In the treatment of chronic urethritis bougies are indispensable.

Metal Bougies.

Nickel or nickel-plated metal bougies should entirely replace the old-fashioned steel bougies, which get rusty and blackened so quickly. The nickel bougies will need replating from time to time, but do not rust. The most useful nickel bougies are those made for me by Montague. They possess the Beniqué curve, and they run on the Charrière scale from 14 to 24. The Beniqué curve is the natural curve of the urethra. These bougies are especially useful under two conditions:

1. *In cases of chronic prostatitis and vesiculitis.* Fill up the bladder with 1 in 5,000 silver nitrate solution. Lubricate and pass a No. 24 bougie, and leave it in place for some minutes. Remove the bougie and massage the prostate and vesicles. The bougie opens up the ducts for drainage, producing also by its weight internal massage of the ducts.
2. *In cases of stricture, both soft and hard,* to prepare the way for Kollmann's dilators, and accustom the urethra to the use of instruments.

Gum-elastic Bougies.

These are made of plaited linen, cotton, or silk thread, into which is worked the special form of shellac varnish known as "gum-elastic." Different pigments are mixed with the shellac so as to produce different degrees of hardness—for instance, there are yellow, brown, red, black, and white gum-elastic bougies. In former days gum-elastic bougies would not withstand boiling. Those now made will usually withstand boiling, provided they are picked out of the boiling water and placed separately on a sterile towel so as to let the heated varnish cool and harden before being rubbed in any way. The white gum-elastic instruments withstand boiling best of all. For occasional use it is always wise to boil a gum-elastic bougie for two minutes. In large clinics the sterilization can be carried out by means of formalin vapour, as described below. One or more complete sets of olive-tipped gum-elastic bougies will be required running from No. 1 Charrière up to No. 18 Charrière. These are used in dilating fibrous strictures of fine calibre after the diagnosis has been made with the urethroscope.

It is always well to possess two or three Harrison whip bougies for use in difficult strictures. As regards the bougies, the best method is to have six, twelve, or eighteen complete sets of these, depending on the size of the clinic and the number of stricture cases likely to come up for treatment at each session. A large oblong case can be manufactured containing a series of sliding trays or drawers, and with a door at one end. Each drawer is divided longitudinally into three parts, and marked with a number. Six drawers are required and eighteen numbered compartments. All the No. 1 Charrière go into compartment one, No. 2 Charrière into compartment two, and so on up to 18 Charrière. At the bottom of the case should be placed two glass capsules. One contains three or four "paraform" tabloids (Burroughs and Wellcome) which give off formalin vapour. The other contains calcium chloride, which sucks up superfluous moisture, and so allows the formalin vapour to get at the dried surface of the instruments. The door must be air tight, and should now be closed. At the end of twenty four hours the instruments are sterile and ready for use.

*The only exception is the urethro-copic tube. Lavage before urethroscopy may spoil the pathological picture. Always give a thorough irrigation of oxycyanide of mercury after urethroscopy.

When a case of stricture comes on the table the door is opened and a suitable bougie picked out, lubricated, and passed, and is then placed in a three-pint enamel jug, containing three drachms of lysol and three pints of cold water. The bougie is used no more that day. At the end of the day's work all the bougies that have been used are removed in this jug to a sink, and left under a running stream of water for ten minutes. At the end of that time the instrument man puts on a pair of rubber gloves, and with a sterile towel wipes the bougies dry, and places them on a second sterile towel. When all are dry he sorts them out into their proper trays, using the metal gauge. He then boils the gauge, removes his gloves, and closes the door of the sterilizer. Next day the instruments are again sterile and ready for use. On no pretence whatever should he be allowed to do this without gloves on, as the instruments are still septic when he dries them. It is extraordinary the prejudice against rubber gloves and the difficulty in persuading an assistant to use them. Yet it is surgical common sense to employ gloves for handling the infected instruments rather than soil the hands with germs and so go about infecting the whole clinic.

Hot formalin vapour is even more potent than cold vapour, and sterilizes in half an hour. It is perhaps more perfect to use hot vapour, but a suitable sterilizer is more expensive and more difficult to manage.

Montague has made for my clinic a metal sterilizer with trays, in which hot formalin vapour is used, and in which an air-pump is employed to pump away the excess vapour after use.

Catheters.

It is well to possess some gum-elastic catheters—say a few No. 4, 8, 9, and 10 on the English scale. The most satisfactory pattern is the "Marshall," either the yellow or the black. These are better even than *coudé* catheters, though it is well that the outfit should also include a few *coudé* black or white catheters and a few conical-ended red gum-elastic catheters provided with a stylet. A few india-rubber catheters are useful—say Nos. 8, 9, and 10 on the English scale.

A long metal stylet is supplied by Montague for threading into gum-elastic and rubber catheters, and is a most useful weapon in emergencies. Finally, never be without two silver catheters, one a No. 10 English of ordinary length, and one a No. 10 English with the long prostatic curve. Metal catheters are sterilized in boiling water.

Gum-elastic catheters are rinsed under the tap, dropped into the boiling sterilizer for one minute, picked out with forceps and laid separately on a sterile towel to cool. The assistant then wipes them dry, and places them upright for twenty minutes to allow the interiors to drain and dry out. (If a hot air cupboard is available they can be placed in that.) When dry the catheters should be placed in a tray of the formalin sterilizer, when they will be found ready sterilized for use when needed.

Dilators.

No up-to-date urethral clinic can afford to be without some form of Kollmann's irrigating dilators. They are absolutely indispensable, and many chronic cases cannot be cured without them. They are shortly to be manufactured in England by John Weiss, Oxford Street, London, and can also be obtained of Gentil of Paris. They are used:

1. For dilating soft submucous infiltrations, or early soft strictures.
2. For finishing off by means of over-dilatation cases of fibrous stricture.

The only way of determining when Kollmann's dilators are required is by means of the aero-urethroscope. This is one of the reasons why I maintain that the urethroscope is indispensable. With this instrument you can blow out the walls of the canal, and with a practised eye can at once determine if any part of the canal is not dilating properly (soft or hard stricture). You can then institute treatment with the dilators and can follow the progress to complete health, controlling your treatment with observation by the urethroscope. In this way a portion of the canal that if left alone would keep up a gleet for a long time and would eventually end in a fibrous stricture, can be detected and treated in the early stages when soft and dilatable. Two objects are thus gained: the cure of the gleet, and the prevention of fibrous stricture. I should be ashamed if any case passed by me as cured were ever to develop stricture in after-life. Into the beds of the London Hospital in ten years came 859 cases of fibrous stricture, which illustrates the importance of this matter. By means of Kollmann's dilators fibrous strictures can be overdilated until they are tired out altogether and cease to recur. At least four out of every five cases of old fibrous stricture that come under my care are thus permanently cured, and in this way the old need for the regular passage of bougies from year to year is done away with—a great boon to many a weary sufferer.

The Kollmann's dilators which I recommend are of two kinds: (1) The straight Kollmann, four branch, irrigating; (2) the curved Kollmann, three branch, irrigating.

They should be nickel-plated or made throughout of nickel. They possess dials marked with the millimetre scale from 22 Charrière up to 45 Charrière. They can be sterilized in boiling water. The *raison d'être* of the Kollmann's dilators lies in the fact that the meatus is the narrowest part of the canal (24 Charrière). It is impossible, therefore, to dilate the penile urethra (28–30 Charrière) and the bulbous urethra (40–45 Charrière) up to the proper calibre by means of ordinary bougies passed through the meatus. The Kollmann can be passed through the meatus, and when in place (straight for the penile urethra, curved for the bulbous) can be screwed up gradually until the calibre proper for this portion of the canal is obtained. After this has been effected the stricture seldom recurs.

In using Kollmann's dilators never employ a local anaesthetic, otherwise you will tear the canal, the patient's sensations being numbed. You do not want to tear the stricture or you will do harm. Your object is to tire out the stricture as rubber or elastic is tired by gradual stretching. Never dilate beyond a slight feeling of stretching and discomfort on the part of the patient. If you cause him intense pain you are overdoing it and defeating your own object. If you cause more than a slight bleeding you are overdoing it. Try to cause no bleeding at all. Bleeding means tearing. Tearing defeats your object.

The treatment always causes an increase of discharge for a day or two and may cause pain on micturition. Warn the patient of this. Do not carry out treatment with the Kollmann on any given case until you have been able to pass at a previous sitting a No. 24 Charrière Beniqué nickel bougie with ease. Do not use the Kollmann unless the urine is clear of purulent haze. Do not employ Kollmann's dilators more than every fifth day. Often every tenth day, or even once a fortnight, is enough. In between the treatments resolution of the stricture appears to take place. The treatment causes some p culiar irritation around the fibrous tissue, so that it becomes absorbed gradually and is replaced by more supple tissues.

As an irrigating fluid for the Kollmann's, use mercury oxycyanide 1 in 4,000 or silver nitrate 1 in 5.000. Never use permanganate. This dries up the mucous membrane and makes the removal of the Kollmann difficult. Always be careful to unscrew and remove the Kollmann while the irrigating fluid is still running through the instrument, so as to prevent nipping or tearing of the walls of the urethra.

Description of Treatment by Kollmann's Dilators.

Have an irrigator ready with two pints of mercury oxycyanide 1 in 4,000 and place a piece of rubber tubing on the end of the irrigating nozzle. Place the patient on a couch with a pot between his legs. Lubricate the Kollmann, and pass it closed until it is snugly in position (straight for the penile, curved for the bulbous urethra). Attach the rubber tubing running from the irrigator and turn on the flow of fluid by releasing the clip. Gradually screw up the handle of the Kollmann until the patient begins to complain of stretching and slight discomfort, or until you can feel resistance against your screwing motion. Note the number on the dial, and then leave the instrument in place for five minutes while the fluid continues to flow. At the end of that time, while the fluid is still flowing, slowly unscrew the handle to the lowest number on the scale, and then gently withdraw the instrument. Just as you take it out you can stop the flow of the fluid by catching hold of the rubber tube running from the irrigator. At the next sitting try and go up one or two

millimetres—seldom, if ever, more. You will obtain much better results by going slowly and by tiring out the stricture gradually.

In the bulbous urethra you can generally screw up at the final sitting to 45 Charrière. In the penile portion in some narrow urethras you may never get beyond 30 Charrière, in average urethras 35 Charrière. Never screw beyond 35 Charrière in the penile unless you are dealing with a very large urethra.

Never use Kollmann's dilators in the acute stage (five to eight weeks). Reserve them for the chronic stage, and never use them unless you have previously examined with the urethroscope and have also passed a nickel bougie on a previous occasion (No. 24 Charrière). As a general rule, do not use the Kollmann until the urine is clear of purulent haze. I advise you never to use Kollmann's dilators in the deep urethra. Only under the most exceptional circumstances does it do good in that situation, and you are likely to do much mischief with it. I know this is in direct contradiction with the teaching of many foreign authorities. All the same, I advise you to make it a general rule to which there are few exceptions.

Care of the Kollmann Dilators.

Irrigating Kollmann's dilators can be boiled after use and kept in a jar of lysol and distilled water, which prevents rusting. At the end of a session they ought to be boiled, dried out of methylated spirit, then dried in an oven, or by means of hot air, or with a "Fon." Finally, they should have sterile vaseline or paroleine worked into each of their joints before being put away.

NERVE GRAFTING AS A MEANS OF RESTORING FUNCTION IN LIMBS PARALYSED BY GUNSHOT OR OTHER INJURIES.

BY

A. W. MAYO-ROBSON, C.V.O., C.B., D.Sc., F.R.C.S.,

MAJOR R.A.M.C.T. (LATE TEMPORARY COLONEL).

AT the present time among the wounded returning from the battlefields are large numbers of cases of paralysed limbs due to more or less serious injuries to nerves.

In many of these cases the nerves are simply contused, and recovery is brought about by Nature's efforts in course of time, but in others, where there is complete destruction of a considerable section of the chief nerve trunks, recovery is impossible without operation. I hope it will not be considered out of place if I draw attention to work which I performed on this subject so far back as 1888.

In February, 1889, I read a paper before the Clinical Society of London on a case of nerve grafting, which was, I believe, the first in which such an operation had been performed in this country on the human subject.

The patient was a girl, aged 14, whose hand was paralysed after the removal of a tumour from the forearm which had involved taking away over two inches of the median nerve. Repair was effected by grafting 2½ in. of the posterior tibial nerve from an amputated leg of another patient, the transfer being effected within a few minutes of the removal of the nerve from the amputated limb. The patient was shown at the Clinical Society, Mr. Christopher Heath being in the chair. A discussion followed, in which Mr. Anthony Bowlby (now Sir Anthony Bowlby, K.C.M.G.) and Mr. Bland-Sutton (now Sir John Bland-Sutton), Mr. Bryant, and the President took part.

Sensation returned within thirty-six hours of the operation, and motion in the paralysed muscles returned gradually. When the patient was shown at the Clinical Society Mr. Bowlby remarked that it was the first recorded case of nerve grafting in this country. I had the opportunity of seeing this patient three years subsequently, when recovery was perfect in every respect.

In July, 1890, my late colleague, Mr. Atkinson, described two cases of his own, two cases of mine, and one case of Mr. Ward's, all of which were, at the time of being reported, progressing satisfactorily or had completely recovered.

The following case is still more important, as it shows that in the absence of recently removed nerve, such a structure as the spinal cord of a rabbit may be successfully used as a graft.

W. R., aged 29, a gardener, was admitted to the Leeds Infirmary under my care on January 18th, 1890, having been sent to me by Dr. Mackay of Hornby. He gave the history of having, seven months before, fallen on a scythe, which had produced a deep incision on the lower and inner part of the upper arm, the brachial artery being divided. At the time of injury a surgeon ligatured the artery, and the two ends of a divided nerve were sutured. The wound healed slowly by granulation.

Condition Before Operation.

On admission to the infirmary the patient was in robust health. There was a scar on the inner aspect of the right arm, extending from a point 2 in. above and to the inner side of the olecranon process, obliquely upwards and forwards for about 3 in. to the inner side of the prominence of the biceps. The circumference of the right forearm was two-thirds of an inch less than that of the left, that of the wrist half an inch less. The hypothenar eminence was absent, the thenar eminence was much atrophied, and the interossei muscles were very much wasted. He had entirely lost the power of grasping, though he could flex the metacarpo-phalangeal articulations to a right angle. Extension of the wrist was possible, apparently with considerable exertion, but flexion of the wrist was impossible against gravity. The thumb could not be adducted nor the fingers separated or approximated. All the muscles acting on the wrist and hand which had their nerve supply from the median and ulnar nerves were paralysed, while those supplied by the musculo-spiral were capable of acting.

Sensation was absent along a narrow line extending over the inner and anterior aspect of the ulnar border of the forearm from the elbow to the wrist. In the palm, sensation was absent except over the thenar eminence and part of the proximal phalanx of the thumb. On the back of the hand it was absent internal to a line drawn backward from the cleft of the middle and ring fingers, also over the whole of the back of the little and ring fingers, as well as over the distal one and a half phalanges of the index and middle fingers. The extensors reacted to faradism; the flexors showed no reaction. To a current of 10 milliampères the C.C.C. was greater than the A.C.C. both in the flexors and extensors.

It was manifest that there had been a complete division of the median, ulnar, and internal cutaneous nerves, and it was clearly useless to attempt anything short of operative interference.

Operation.

On January 30th, 1890, the limb having been previously aseptiçized, ether was administered, and an incision made along the line of the cicatrix; it was prolonged some distance upwards and downwards, and supplemented by a transverse incision about an inch above the elbow. The ulnar nerve was soon exposed above the internal condyle; it was firmly fixed in fibrous tissue. The lower end of the upper segment, which was bulbous, was connected by fibrous tissue with the upper end of the lower segment. A long search was then made for the median nerve, as the large cicatrix had altered the normal anatomy of the parts. A small nerve was discovered at the upper part of the wound, which proved to be the internal cutaneous. The lower end of this nerve was discovered later, and united to the upper by a catgut suture. The internal intermuscular septum was divided 1½ in. above the internal condyle, and the atrophied remains of the brachial artery defined. At last, about the middle of the upper arm, the bulbous lower end of the upper segment of the median nerve was discovered well under, and concealed by, the belly of the biceps. Later the upper end of the lower segment was found just above the bend of the elbow. This extremity was expanded, and sent ramifications into the cicatrix. The fibrous tissue between the ends of the ulnar nerve was excised, and the two healthy portions were united by grafting strands of the sciatic nerve of a rabbit so as to fill up the gap and produce continuity. It was quite impossible to bring the divided ends of the median nerve nearer than 2½ in. All the nerve tissue at my disposal having been exhausted in uniting the ulnar nerve, Mr. Littlewood, who was assisting me, dissected out the spinal cord of a rabbit just killed, and this was used as a graft to connect the ends of the median nerve, the inserted cord lying loose and quite free from tension when finally placed in position. Fine catgut sutures were used throughout. The edges of the wound were brought together and the usual dressings applied, the arm being fixed on a rectangular splint. Healing occurred by first intention, and there was an entire absence of fever or pain.

Early After-History.

On February 10th the patient could feel the scratch of a pin on the flexor aspect of the first phalanx of the thumb, as well as at the root of the index finger. He could tell when the hairs on the back of the first phalanges of the ring and little fingers were pulled, but could not feel the scratch of a pin in that position.

On February 17th sensation had returned over the whole of the palmar surface of the thumb and the proximate phalanx of the index finger.

On March 4th sensation seemed to be creeping slowly along the first finger, and to be present over the whole of the palmar area supplied by the median nerve, and extending as far down as the web of the fingers, and a short distance along the middle finger. As yet there was no marked improvement in the ulnar distribution.

On March 6th electrical reaction to faradism was absent in the muscles. C.C. 15 milliampères, C.C.C. equal to A.C.C. in flexors; C.C.C. greater than A.C.C. in extensors. The muscles were

gradually developing, and the general nutrition of the hand showed improvement. There was slight power of grasp and some power of flexion in the wrist, as well as slight power of adduction of the thumb and flexion of the fingers. Sensation was felt all over the thumb and index finger, in the second finger up to the first phalanx on the palmar aspect, also in the third finger, though less distinct. No sensation could be elicited over the distribution of the ulnar nerve.

On March 30th he began to have sharp shooting pains along the distribution of the ulnar nerve. On April 1st the flexors of the forearm began to react visibly to C.C.C., though the muscles of the thenar eminence did not, and there was no faradic reaction. On April 30th sensation was returning at the back of the ring finger, and the flexors now reacted to A.C.C. of 5 milliampères.

On June 13th the nutrition of the hand was much improved, and there was a greater feeling of warmth in it. He could pick up small objects, and although the grasp was not powerful, it was much improved. The powers of flexion of the wrist and adduction of the thumb were considerably increased, but there was no sensation as yet over the ulnar distribution.

Condition of the Patient Six Years after Operation.

Being interested in the case, I made inquiries from time to time after he left Leeds, but I never saw him again until February, 1896, six years after the operation, when I asked him if he would let me demonstrate his case at the Leeds and West Riding Medico-Chirurgical Society, where my colleagues and other members of the society had the opportunity of seeing him. Dr. Mackay had applied galvanism to the muscles of the forearm and hand from time to time, from the time of his leaving Leeds until the middle of November of the same year, when all treatment was stopped. He did not resume work till March, 1891, not because he was unable to undertake light work, but, as the patient put it, "He wanted to give the arm a fair chance of complete recovery." Since March, 1891, he had not missed a single day's employment, and was able to do all his duties completely, from wheeling a well-laden barrow to using a scythe.

There was a firm round scar along the inside of the arm. The circumference of the right forearm was 11 in., left forearm 11½ in.; right wrist 7 in., left wrist 7½ in.

From these measurements it will be seen that the muscles had almost completely returned to their former volume, and in the hand all the muscles except the abductor of the thumb were as well developed as in the left; this was quite as well marked in the interossei as in the other muscles. The movements of the arm were completely restored and almost as perfect as in the left. Flexion of the fingers and the grasp had completely returned, and the only weak muscle was the abductor of the thumb, which had no perceptible power. Sensation was completely restored, as was easily demonstrated by touching the different portions of the arm and hand with a pin.

All the muscles of the arm and hand reacted to faradism except the abductor of the thumb.

It will thus be seen that, though the recovery had been tardy, it was complete in almost every respect, the only exception being that of the abductor pollicis, which for some unexplained reason did not recover its function. The case is very encouraging, since it clearly demonstrates the possibility of restoring continuity of nerves by grafting. Whether the spinal cord in this case simply served as a basis on which the nerve tissue was built up I am unable to say, but that it answered its purpose is clearly shown in the report of the case. Why restoration of function in the ulnar nerve should have taken longer than in the median I am unable to say, as the ends of the nerve were not separated more than ¾ in., whereas the ends of the median nerve were between 2 in. and 3 in. apart. Could it be that the spinal cord offered a better medium for establishing continuity? The patient was seen years subsequently, completely recovered in every respect.

Since operating on the above cases I have had considerable experience in the surgery of nerves, both with regard to suture of divided ends and in nerve grafting.

During the present war I have had experience both in the Dardanelles, in Egypt, and in the base hospitals at home in the treatment of nerve injuries, and my previous experience in civil practice has stood me in good stead in dealing with this class of cases.

Nerve grafting cannot, of course, be successfully performed in septic wounds, but where the paralysis remains after healing of the wound and it is known that it is not merely due to division of nerve or of some portion of the nerve trunk, as shown by the paralysis not improving under treatment, it seems to me desirable that too much time should not be allowed to pass before operative treatment is adopted in one or other of the ways I have described above, as it will lead in a large number of cases, if not in all, to complete restoration of function and thus to saving of otherwise useless limbs.

NOTE ON THE INCIDENCE OF TETANUS AMONG WOUNDED SOLDIERS.

BY

SURGEON-GENERAL SIR DAVID BRUCE, C.B., F.R.S.

THE principal object of this paper is to draw attention to the effect of prophylactic injections of antitetanic serum in lowering the incidence of tetanus among wounded men. The chart represents the ratio of cases of tetanus to number of wounded men from the beginning of the war to the end of 1916. This diagram has been made up, not from all the cases of tetanus which have occurred, but only from those which have arisen in home hospitals among the wounded men sent to England from overseas. It does not include cases which have occurred in France or elsewhere.

It will be seen that the ratio in September, 1914, is 16 per 1,000; in October, 32 per 1,000; and that it falls in November to 2 per 1,000, about which figure it remains until the present date. To what cause must this remarkably sudden fall be attributed? No doubt there were various factors at work, but beyond all reasonable doubt the introduction of prophylactic injections of antitetanic serum was the preponderating cause. To understand this it may be well to give a short account of the movements of our army during these first months.

The bulk of the British Expeditionary Force crossed over to France on the night of August 12th and 13th, 1914. On the 18th and 19th the troops began to move northwards into Belgium.

The battle of Mons and the retreat took place between August 23rd and 30th. During the retreat many of the wounded fell into the enemy's hands, and on our own part it was impossible in many cases to carry out any thorough surgical treatment of the wounds owing to the hurried nature of the retreat.

The battle of the Marne was fought between September 7th and 10th.

On September 13th the British Expeditionary Force reached the valley of the Aisne, and remained here until the end of the month. This was the ground where probably many cases of tetanus were infected. The soil is rich and fertile, and has an evil reputation for tetanus. Here in ordinary times it is found necessary to inoculate the farm horses at intervals with tetanus antitoxin as an ordinary measure of precaution.

The troops left the valley of the Aisne about October 3rd, and took up positions at La Bassée and its neighbourhood, where fighting took place from October 11th to the end of the month.

The severe fighting round Ypres, in which a separate division of the army took part, began on October 20th and continued until November 11th, 1914.

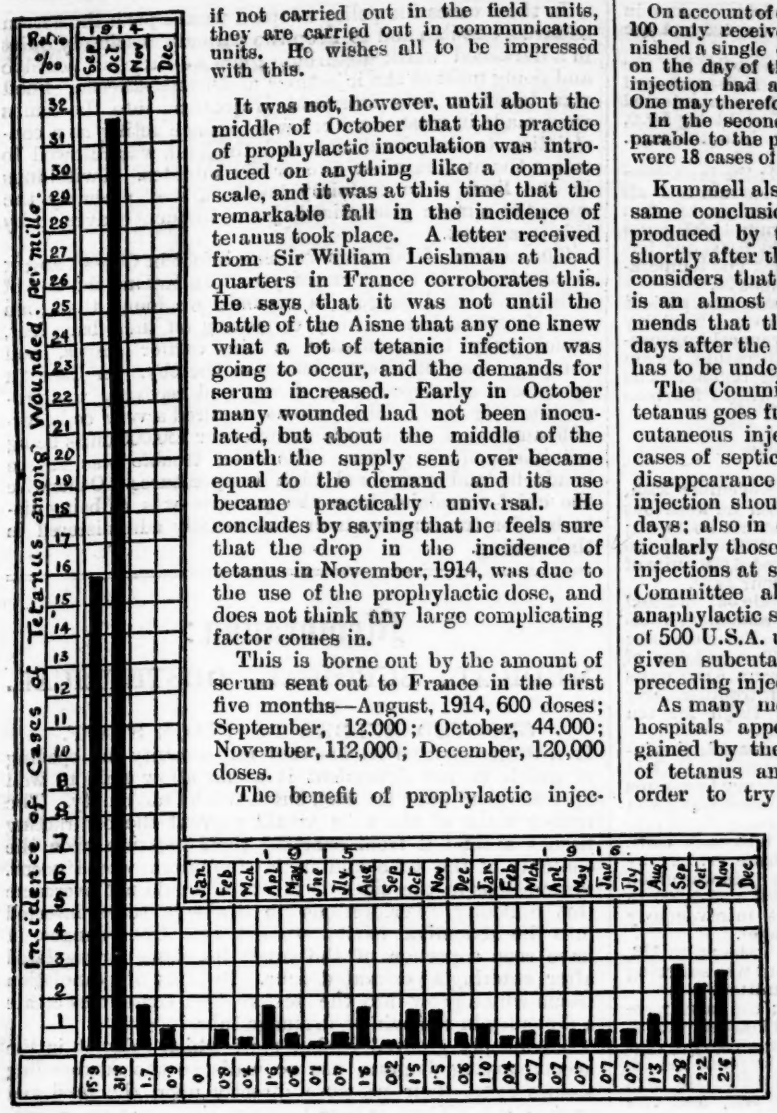
It is evident, then, that the 16 per 1,000 cases of tetanus among the wounded which occurred during September, must have been contracted at the battle of the Marne and in the valley of the Aisne. Further, that the abnormally high ratio of cases of tetanus which is found in October must have been to a great extent due to the tetanized soil of the Aisne valley.

There were therefore several factors at work in September and October, 1914, to raise the ratio—the heavy fighting with the consequent heavy toll of wounded, the highly infective character of the soil, the difficulty of collecting the wounded on account of their numbers and the movements of the troops, and finally the difficulty of giving the thorough surgical treatment to their wounds which is so essential in the fight against tetanus.

But there was another, and that the most important, factor which has not been taken into account—the prophylactic injection of tetanus antitoxin. This was not carried out during the first two months of the war. It would appear that in the beginning only a small quantity of antitoxin was taken out with the Expeditionary Force for purposes of treatment, and it was only when the number of cases of tetanus became alarming that steps were taken to ensure that every wounded man should receive a prophylactic dose.

Lord Kitchener telegraphed to the Director of Medical Services, Expeditionary Force, on September 8th as follows:

Earl Kitchener desires information as to whether antitetanus inoculations are being practised for wounded, and whether,



if not carried out in the field units, they are carried out in communication units. He wishes all to be impressed with this.

It was not, however, until about the middle of October that the practice of prophylactic inoculation was introduced on anything like a complete scale, and it was at this time that the remarkable fall in the incidence of tetanus took place. A letter received from Sir William Leishman at head quarters in France corroborates this. He says that it was not until the battle of the Aisne that any one knew what a lot of tetanic infection was going to occur, and the demands for serum increased. Early in October many wounded had not been inoculated, but about the middle of the month the supply sent over became equal to the demand and its use became practically universal. He concludes by saying that he feels sure that the drop in the incidence of tetanus in November, 1914, was due to the use of the prophylactic dose, and does not think any large complicating factor comes in.

This is borne out by the amount of serum sent out to France in the first five months—August, 1914, 600 doses; September, 12,000; October, 44,000; November, 112,000; December, 120,000 doses.

The benefit of prophylactic injections in tetanus is also vouched for from both France and Germany. Bazy, in the *Comptes rendus de l'Académie des Sciences*, vol. 159, states:

> In medical units where surgeons perform systematic prophylactic injections, as I do myself, to all wounded at the moment of entry, the incidence of tetanus is 4.18 per 1,000. In the medical units where this injection is only made to cases thought to be suspicious the incidence is 12.79 per 1,000. The incidence, therefore, is three times greater in the services where injections are only made to certain categories of wounded than in those where it is made systematically to all wounded.

On account of certain circumstances in a batch of 200 wounded, 100 only received a prophylactic injection. This series furnished a single case of tetanus, and in this case tetanus began on the day of the injection, so that one could not say that the injection had a chance to exercise any prophylactic action. One may therefore say the incidence was zero.

In the second batch of 100, which presented wounds comparable to the previous batch but received no injection, there were 18 cases of tetanus—that is to say, 18 per cent.

Kummell also, in the *Berlin. klin. Woch.*, comes to the same conclusions. He says that the picture of tetanus produced by the severity and the number of the cases shortly after the outbreak of the war has disappeared. He considers that early prophylactic injection of the wounded is an almost certain preventive of tetanus, and recommends that the injection should be repeated about seven days after the first injection if an operation, however slight, has to be undertaken.

The Committee of the War Office for the study of tetanus goes further and recommends that a second subcutaneous injection of 500 units should be given in all cases of septic wounds, and in order to anticipate the total disappearance of the antitoxin from the body the second injection should follow the first at an interval of seven days; also in cases of long-continued septic wounds, particularly those caused by shell or bomb, third and fourth injections at seven-day intervals are recommended. The Committee also states definitely that the danger of anaphylactic shock is negligible when prophylactic doses of 500 U.S.A. units contained in 3 c.cm. of horse serum are given subcutaneously, whatever the interval after the preceding injection.

As many medical officers doing duty in home military hospitals appear to be doubtful as to the good to be gained by these second and further prophylactic doses of tetanus antitoxin, this paper has been written in order to try to strengthen their faith. There can surely be no doubt in anybody's mind that an ounce of prophylactic serum is worth pounds of the same serum used therapeutically. There is always a chance that a wounded man in the confusion and stress of a crowded clearing station may escape his first prophylactic injection. So much the more reason, then, that he should get one as soon as he arrives in a home hospital. To inject two or three cubic centimetres of serum under the skin causes no great trouble, and cannot be dangerous. As Kummell says, the picture of tetanus as seen at the beginning of the war has quite changed. The incubation period has become longer, the number of cases of localized tetanus has greatly increased, and the mortality has been lowered.

Conclusion.

The incidence of tetanus among wounded men falls sharply on the introduction of prophylactic injections of antitoxin, and it is much to be desired that the primary injection be followed up by secondary and further prophylactic doses as long as the wound remains suspicious.

NOTES ON THREE CASES OF TETANUS.

BY

CAPTAIN R. I. DOUGLAS, R.A.M.C.(T.C.), AND CAPTAIN C. H. CORBETT, R.A.M.C.(T.C.).

In view of the uncertainty that still seems to exist as to the appropriate treatment of tetanus with antitetanic serum, and the desirability of putting all cases of recovery on record, it is thought that the following three cases will prove interesting. They are examples of cases in which a vigorous policy in serum treatment has apparently helped to ultimate recovery.

Case I.

Pte. I. Frostbite in both feet, contracted on November 25th, 1915, and following three days. On December 15th the toes on both feet were gangrenous. Antitetanic serum 1,500 units was given subcutaneously as a prophylactic dose. On the following day he had a sore throat and the temperature was 100° F. On December 18th he had slight stiffness in the jaw and the back of the neck. The knee-jerks were very brisk, and he complained of twitchings in both legs. Spinal puncture was made, and clear fluid drawn off; it was subsequently found to be bacteriologically sterile. Antitetanic serum 8,000 units was given intrathecally, and the patient was removed to a secluded darkened ward.

On December 19th the symptoms were increased. The temperature was 102° F., the pulse 96, and the respirations 30. The toes were painted with iodine and spirit. Antitetanic serum 5,000 units was given subcutaneously, and 6,000 units intravenously (arm). On December 20th there were increased twitchings in the legs on attempted movement and risus sardonicus. Antitetanic serum 4,000 units was given intrathecally under chloroform.

On December 21st he was not so well; four or five spasms were noticed during the day and much reactionary stiffness following them; there was some difficulty in swallowing. Antitetanic serum 2,000 units was given subcutaneously and 8,000 units intramuscularly into the thighs below the level of a tight bandage by which the circulation was partially obstructed for ten minutes; 6,000 units were given intravenously in the right leg below the bandage, and 6,000 intrathecally (under chloroform). He had a bad night, and on December 22nd the musculature generally was stiff, swallowing was difficult, he would not take food, and was obviously frightened to attempt movement. Antitetanic serum 10,000 units was given intramuscularly into the calves (5,000 into each calf below the level of a bandage), and 10,000 units intravenously (5,000 into each leg

below the bandage). He was given chloral hydrate gr. xxx in solution by the rectum at 9 p.m. The pulse was 108 and the temperature 100° F

On December 23rd he could be handled more easily, but the stiffness was as marked as before. A serum rash appeared on the chest. Antitetanic serum 9, 00 units was injected intramuscularly, and 9,000 units intravenously (right leg 3,000, left leg 6,000), and 2,500 units intravenously into the arm. Wounds on feet looking well.

On December 24th his condition was improved; the jaws were less rigid, but the back was still arched. He had serum rash all over, but was taking food a little better. Chloral gr. xxx was given by the rectum as before. Antitetanic serum 11,000 units was given intramuscularly in the thighs (right 6,000 and left 5,000), and 6,000 intrathecally under chloroform. The temperature was 101° F., the pulse 116, and the respirations 26.

On December 25th all treatment was omitted; the patient was very much under serum, and had rash all over. Next day he was taking food fairly well, and showing general improvement. He was given a soap enema. Antitetanic serum 10,000 units was given intramuscularly (scapular region). The patient had no more antitetanic serum, and within fourteen days was able to be evacuated apparently cured.

CASE II.

Pte. W. Frostbite of both feet, contracted November 25th, 1915, and following two days. On November 28th he went out digging in his socks, as he said he could not get his boots on; he reported sick with his feet that evening. Stiffness of the jaw appeared on December 16th, and he received 3,000 units of antitetanic serum subcutaneously for the next four days.

On December 22nd his condition was as follows: Marked stiffness of jaws and risus sardonicus, boarded abdomen, knee-jerks very brisk with clonic movements of leg. Pulse normal; the bowels had not been open for two days. Two patches of gangrene on toes of both feet. Antitetanic serum 6,000 units intrathecally (under chloroform), and 6,000 intramuscularly (3,000 units into each leg below bandage on thigh for ten minutes), and also 3,000 units subcutaneously.

On December 23rd the jaw stiffness had increased, the intellect was quite acute, and he seemed fairly cheerful. He had some difficulty in swallowing, and increased tendency to spasms starting in the legs. Antitetanic serum 6,000 units was given intrathecally as before; 10,000 units intramuscularly (5,000 into each calf), and 3,000 units intravenously (1,500 into each calf). He was given a soap enema and chloral hydrate gr. xxx by the rectum. Next day he was much the same. He was given 10,500 units antitetanic serum (5,500 units in left and 5,000 in right thigh below bandage); also 10,500 unit intravenously (right arm 5,500, and left calf 5,000, below bandage).

On December 25th the temperature was 103°, the pulse 118, and the respirations 36. He seemed less stiff, but was suffering considerable reaction, and the treatment was omitted.

Next day the main condition was improved; the jaws were less stiff, and the tendency to spasms much less marked. Antitetanic serum 10,500 units was given intramuscularly (right calf 5,000, left calf 5,500). On December 27th the pulse was 98, the respirations 26, and the temperature 100° F. He was improving steadily; no further serum was given, and two weeks later he was evacuated apparently cured.

CASE III.

Wound of left hand one month previously to onset of symptoms. On December 12th he had twitching in hand, and on December 14th stiffness was noticed in the jaw and neck, but no generalized spasm.

On December 18th antitetanic serum 8,000 units was given subcutaneously (chest), and 7,000 intravenously (bend of left elbow). On December 20th the jaw seemed rather less stiff, but the hand twitched still. Antitetanic serum 5,000 units was given subcutaneously. Next day he was not so well; the jaw stiffness had increased. Antitetanic serum 6,000 units was given intrathecally under chloroform, and 6,000 intravenously in the left arm (below a bandage round the upper arm), and 9,000 units intramuscularly and subcutaneously.

On December 22nd, as the headache and temperature continued, he was given antitetanic serum 10,000 units intravenously as before, and antitetanic serum 10,000 units intramuscularly. Next day the arm twitchings were lessening, the jaw and neck were in the same condition. Antitetanic serum 10,000 units was injected intravenously as before, and 10,000 units intramuscularly.

On December 24th the back was rigid, but he was otherwise much the same. He was given antitetanic serum, 6,000 units extradurally and 3,000 intra-aponeurotic, under chloroform, and 9,000 intramuscularly (5,000 units in the gluteal region and 4,000 units in the arm). An urticarial rash appeared on the chest. Next day the general twitchings had all disappeared; the jaw was still stiff, the back and neck less so. He had a serum rash on the chest and arms. The pulse was 100, respirations 38, and temperature 102° F. He was given antitetanic serum 10,500 units intramuscularly (arm).

On December 26th the rash had spread all over, but the twitchings were absent, and the general stiffness was lessening. No antitetanic serum treatment. Next day slight twitchings reappeared in the arm, but the jaw and neck were less stiff. He was given antitetanic serum 10,000 units intramuscularly (arm). The improvement continued, and the patient was eventually evacuated without further symptoms.

In these cases the policy adopted was to push the serum as far as possible and to keep the patients absolutely quiet in a darkened ward, disturbing them as little as possible and doing most of the injections under anaesthesia. Food was taken at long intervals. Injections into the limbs were made in most cases below a bandage acting as a constriction to the circulation, and the limb was allowed to retain the antitoxin for five or six minutes. Twitchings in the limb were certainly lessened, and probably the spread to a more generalized spasm frequently averted by this treatment.

The source of infection in trench foot in Cases I and II is interesting at this time of year. In tracing the day of infection careful inquiry is needed; we found that men with frostbite have a way of getting on their bare feet, which may be insensitive in the earlier stages, and running risks of tetanus infection thereby. In Case III symptoms developed very slowly and recovery was proportionately slow. The patient required a very considerable amount of antitetanic serum, over 130,000 units being administered altogether. His chief trouble was severe headache and occasional high temperatures. Otherwise the chief complaint from the patients was at being disturbed for treatment which was usually administered in the evening.

Memoranda:

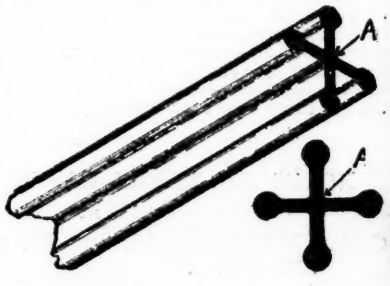
MEDICAL, SURGICAL, OBSTETRICAL.

GROOVED RUBBER DRAINAGE STAFF.

IF a drainage tube be inserted into a cavity the opening of which is not dependent it would allow fluid to well up and pour over its exit, but it would not empty. The rubber walls of the tube would prevent the contracting tissues around it from exerting their pressure upon the contents of the tube and in it stagnation would occur. Perforations in the sides of the tube would not overcome this difficulty. Perforations in drainage tubes inserted into the abdominal cavity are not free from danger. I have seen a portion of the small intestine strangulated after entering a perforated tube. Buttons of granulation tissue which grow into the perforations sometimes create a difficulty in removing a drainage tube

The deeply grooved rubber staff which I depict in the accompanying diagram has no walls, so the surrounding tissues exert their pressure directly upon the fluid and push it out. There is therefore not the same encouragement for fluids to stagnate, and none of the objections encountered in perforated tubes arise.

I have used this method of drainage in abdominal cases, amputation wounds, breast cases, and in many other conditions, and it has justified its existence.



The central stalk (A) must not be made too big, it should be as small in diameter as possible so that it cannot act as a plug. Useful sizes for rubber conductors of this kind are an inch, three-quarters of an inch, and half an inch in diameter.

Messrs. Down Bros. were making these tubes for me in 1913 and 1914, when many of my friends and I were employing them in hospital and private practice. I would not have mentioned these dates were it not for the fact that Mr. C. Max Page published in the BRITISH MEDICAL JOURNAL of October 16th, 1915, an article "Observations on the drainage of gunshot wounds.' His observations led him to design tubes which are like mine. He has also pictured others which resemble those Down Bros. made for me in experiments I was conducting in the years 1913 and 1914. Hence Mr. Page and I have evolved independently the same kind of tube, but its evolution was not based on the same ideas.

Haslar. G. LENTHAL CHEATLE.

SODIUM SALICYLATE IN THE TREATMENT OF "TRENCH FEET."

In the winter of 1914–15 many of the cases of "trench feet" which came under my care were apparently suffering mainly from a neuritis caused by cold and wet, so I gave them sodium salicylate, and had no reason to be dissatisfied with the result. My purpose in drawing attention to this result now is not to discuss the pathology of the condition but to indicate a line of treatment which seems to me to lessen pain and hasten recovery, yet one which is not generally followed. Sodium salicylate is scarcely mentioned in the literature of "trench feet," if indeed at all, and I know of a number of hospitals in which it is not used. A recent opportunity has been afforded me, by the kindness of my colleagues, of comparing cases treated by sodium salicylate with others dealt with in other ways.

On December 21st last a convoy of men suffering from trench feet was admitted to No. 1 Temporary Hospital, Exeter, and six cases had come in on December 18th. Of these cases fifty-nine seemed reasonably comparable, in so far that no serious surgical complications existed; twenty seven were put on sodium salicylate; thirty-two were otherwise treated. No special selection of cases was made; it was a matter of pure chance which cases came into either group. All had their feet rubbed daily and all were first placed in the wards; only when much improved were any cases removed to our tents, where they had more moving about and were more exposed to the weather. All had pain on admission.

Results on December 24th.

	On Salicylates.	Not on Salicylates.
No pain	4*	0
Severe	8*	4
Worse	3	8

* One admitted on December 18th.

This suggests that at least as many "severe" cases had been included in the group on salicylates as in the other.

Results at Subsequent Dates.

	On Salicylates.	Not on Salicylates.
December 29th:		
No pain	4	2
Slight pain	12	8
Moderate pain	4	11
Severe pain	7	11
January 2nd:		
No pain	7	0*
Slight pain	16	15
Moderate pain	3	13
Severe pain	1	4
January 9th:		
No pain	15† (8 in tents)	8‡ (4 in tents)
Slight pain	8	15
Moderate pain	4 (1 in tent)	8 (4 in tents)
Severe pain	0	1

* In the two free from pain on December 29th pain had returned slightly
† Three admitted on December 18th.
‡ Two admitted on December 18th.

On January 9th, amongst those who had "no pain," the average duration of the cases was practically the same in the two groups—that is, 26.2 days for those on salicylates and 25.5 days for the others. Carefully considering all the circumstances, the two groups seem to me quite comparable, and the seemingly superior results given by the salicylates to be probably real.

In confirmation of this conclusion I may mention:

1. My former experience.
2. The fact that the cases in one ward were deprived of their salicylate for twenty-four hours and considered they did worse without them.
3. A case which was not on salicylates had "severe" pain and was put on them; in three days his pain was "slight."
4. Some of the cases not on salicylates were given aspirin occasionally when in bad pain and were relieved by it.

Aspirin is the one form of salicylate of which common mention is made in the literature, but only, I think, as an occasional analgesic. I think it may be fairly claimed that the salicylate is a useful means of relieving pain and shortening its duration. The exact formula used has been:

℞

Sod. salicylate	gr. x
Spt. am. arom.	♏ xv
Tinct. cinchon. co.	♏ xx
Syr. aurant.	ʒ ss
Aquam	ad ʒ j

Every four hours until the pain is slight; then thrice daily.

Some other observations may be worth mentioning, namely:

(*a*) The most valuable remedy used for the pain was rubbing.

(*b*) Galvanism (my colleague, Dr. Mabel Gates, finds) was also valuable.

(*c*) In severe cases hot fomentations over belladonna paint were often useful.

(*d*) So was laudanum sprinkled on flannel.

(*e*) Radiant light and heat often helped.

(*f*) The whirlpool bath sometimes helped.

(*g*) Local application of hot brine sometimes helped.

(*h*) Local plain hot water sometimes made matters worse.

(*i*) Walking on the tender feet did harm.

W. GORDON, M.D., F.R.C.P.,
Medical Officer attached to No. 1 Temporary Hospital, Exeter.

Reviews.

BIOLOGY OF TUMOURS.

THE origin of tumours has been a prolific source of controversy. In his *Biology of Tumours*[1] Mr. MANSELL MOULLIN continues the presentation of his idea, begun in the Bradshaw lecture delivered before the Royal College of Surgeons of England in 1912. He states that the conclusions he has reached differ in many particulars from the views current generally, and he therefore expects to meet with a good deal of adverse criticism.

The premisses on which his thesis is based may be summed up in the indestructibility of cell character—as it was in the beginning it is now. The primitive cell was asexual and reproduced its kind asexually. In the higher organism this power of the cells is in abeyance, but may on suitable stimulus reappear. The normal germ cells are busy reproducing on other lines, the normal somatic cells are wholly given up to their special work. Check the normal development of either, and each may revert to the asexual process of reproduction, and produce a bad attempt at a second generation or bud—or, in other words, a tumour. The nature and stage of growth of the parent cell will determine the character of the bud. If the parent cell is still in the actively-growing embryonic stage at the moment development is arrested, and the bud is given off, the bud will be embryonic too, and a tumour of great "malignancy" result. If the parent cell has nearly reached its perfect form the bud will grow slowly, and merely push aside neighbouring structures without invading them, and a "non-malignant" tumour results. It is the degree of maturity of the parent cell that determines benignity or malignancy; there is no difference save in degree. The bud that would form an innocent tumour if the parent cell had nearly reached maturity, will grow into a malignant one if it is still in the embryonic stage. So long as development continues as it should, work is properly done, growth and reproduction never break

[1] *The Biology of Tumours.* By C. Mansell Moullin, M.A., M.D.Oxon., F.R.C.S., Lieutenant-Colonel R.A.M.C.(T.). London: H. K. Lewis and Co., Ltd. 1916. (Demy 8vo, pp. 55. 2s. 6d. net.)

bounds, and the tissues never give birth to the irregular structures known as tumours. If the influence of development is removed, control over growth and reproduction is lost, the latent power of the tissues is set free, and all that is needed is a stimulus such as local irritation to start it on its course. Both development and growth are the outcome of chemical changes that take place in the living tissues, or the outcome of the persistent cultivation of a special series of chemical reactions brought into existence by the special work assigned to that particular part of the body. If these processes are faulty, development is arrested, and reversion to the primitive asexual type of growth may follow on some exciting cause. The reaction of tumours, both in origin and course of growth, to chemical influence is known.

The inheritance of tumours is denied as such, but it is argued that the influence of the somatic cells upon the germ cells may be so great as to determine their course of development or arrest of development, and these in their turn may produce faulty somatic cells prone to failure in growth. The somatic cells are stamped with the impress of the altered conditions under which the parent lived. Such a condition may be handed down through generation after generation, though in the absence of the necessary stimulus it may never result in actual tumour growth.

A second class of tumour is that due to structural defects. Development implies not only progressive advance of tissues in use, but also the recession and disappearance of those that have ceased to be of use. Evolution and involution are necessary; arrest of either may lead to tumours. Failure of evolution leads to such tumours as spinal meningo-myelocele, failure of involution to cysts of Wolffian or Müllerian remnants, or the graver growths of the post-anal gut.

The thesis advanced is highly suggestive, and should provoke thought.

ANXIETY IN MENTAL DISEASES.

DR. G. BERGONZOLI has written a full and scholarly account of states of mental anxiety as met with in patients with mental disorders and mental disease.[2] Such anxiety, he says, is a symptom, and not a morbid entity. It depends upon an alteration in the psychical and organic life of the individual, and is not to be regarded as a mere exaggeration of the emotion of anxiousness that is found in ordinary people. Pathological states of anxiety occur in persons with hereditary taint, degenerates, those who are unduly emotional; neurotics exhibit it, and still more the victims of various types of psychosis. Among these, the insane, anxiety is a feature most often associated with depression and obsessions; yet Dr. Bergonzoli thinks it undesirable to establish a classification of neurotic persons or the insane according as excessive anxiety is or is not a prominent feature in each case.

He attributes a preponderating part to changes in the sympathetic system and the bulb in the pathogenesis of anxiety in these patients. Such a view may be criticized as purely hypothetical, perhaps; yet it is at any rate preferable to Freud's theory that such anxiety is due to incomplete satisfaction of the sexual passions. Alternatively, and, one may say, inevitably, states of mental anxiety may be attributed to some alteration in the functions of the endocrine glands. No special therapy seems to be indicated; the patient is to be treated on the general lines indicated by his neurosis or psychosis, as the case may be. Dr. Bergonzoli has laboured mightily with the literature of the subject, quoting a list of over 370 authorities he has consulted. The book is well written, and though it appears to break no new ground it may be recommended to alienists in search of a general account of the subject.

REFRACTION OF THE HUMAN EYE.

THE work of THORINGTON of Philadelphia in systematizing and popularizing the methods of examining and correcting errors of refraction is well known. Several smaller works written by him have met with much appreciation by the profession, both in the United States and in Europe. This new work[3] of his incorporates the smaller books, and the resulting volume is excellent, both in its matter and method. The aim of the book is practical rather than theoretical.

By being dogmatic rather than ambiguous, by occasional repetitions to avoid frequent references, and by simple explanations and a definite statement of facts, the writer has aimed to make the text concise and comprehensive. Consequently, there are no lengthy mathematic formulas or any discussion of disputed points.

In arrangement the book follows familiar practice. A sufficient statement is given on the principles of optics. From it the effects of prisms are worked out and made easy of understanding by references to common observations. Then the effects of combined prisms or lenses are illustrated.

With this introduction the student is brought to the standard human eye and learns the normal mechanism of its working; and eventually to the many faults of the ordinary human eye, and their manner of detection and correction.

The author has dropped the word "skiascopy," or shadow test, in favour of the term "retinoscopy," and the concentration of the worker's attention on the light reflex. Experience shows that the change is more than a matter of nomenclature, for it encourages rapid appreciation of principles involved, and far better results in the application of these to treatment. An excellent feature in the work is the insistence on the necessity for a system in the examination of the eyes and in the record of the results. A good scheme is sketched out for the guidance of the beginner.

The final sections on the prescribing of glasses, the use and value of the various forms of lenses and frames for different classes of patients are likely to prove very useful; whilst the last chapter, on "Lenses, spectacles, and eyeglass frames: how to take measurements for them and how they should be fitted," puts the worker in possession of the main facts of the optician's craft, enables him to write his prescriptions with understanding, and if necessary to give complete directions for the preparation and fitting of the frames. These are workaday details too often neglected in medical works. Altogether the book is to be commended; it is sure to take a high place in the ranks of practical handbooks.

NOTES ON BOOKS.

THE drawings in the second number of *The Western Front*[4] are striking proof of the truth that, even regarded merely as a registrar of facts, the artist is more truthful than the camera. Mr. MUIRHEAD BONE has seen the essential things, and conveys them to the mind's eye. There will be many who think they recognize the actual roads he has drawn, with the screen in one, and the pole across another "liable to be shelled"; perhaps some will be wrong—the truth being that the drawings give a sort of abstract impression of what such roads are. As in the previous number, there are several drawings illustrating the evacuation of wounded; one showing the stretcher-bearers passing from a crowded quay to the gangway of a hospital ship; and three, the walking wounded on deck. There are vivid impressions of the ground over which the fighting of the Somme took place, and a very striking drawing of the cathedral of Amiens with aeroplanes circling round it, which shows what Mr. Bone can do when he chooses to be precise. The series promises to be one of the most interesting records of the war.

In his book on *Poverty and Its Vicious Circles*[5] Dr. J. B. HURRY gives a general view of the problems of poverty and the best means of curing them. Like so many writers before him he has no difficulty in showing that poverty, incompetence, drink, disease, and other evils, all interact in our social life, one leading to another, and all conducting their victims on the downward path. The cure of poverty is to be sought by breaking the vicious circle in each individual case at the most remediable spot. Dr. Hurry

[2] *Stati Ansiosi nelle Malattie Mentali.* Dott. Gaspare Bergonzoli. Voghera: Officine d'Arti Grafiche Boriotti-Majocchi-Zolla. 1915. Sup. roy. 8vo, pp. 186.)

[3] *Refraction of the Human Eye and Methods of Estimating the Refraction.* By H. Thorington, A.M., M.D. London: W Heinemann. 1916. (Fcap. 4to, pp. 420; 334 illustrations, 27 of which are coloured. 10s. 6d. net.)

[4] *The Western Front.* Drawings by Muirhead Bone. London: Published by *Country Life* and G. Newnes, Limited, for the Government. Monthly, 2s. net.

[5] *Poverty and Its Vicious Circles.* By J. B. Hurry, M.A., M.D. London: J. and A. Churchill. 1916. (Demy 8vo, pp. 194, 5s. net.)

shows up the harmfulness of the indiscriminate charity so dear to the hearts of almost all of us, and indicates the limits of the policy of *laissez faire* in social economics. His point of view is well worth the study of all charitable workers and social reformers.

The Uniform System of Accounts,[6] designed for the use of hospitals and other institutions by Sir HENRY BURDETT, K.C.B., now in its fourth edition, is a work invaluable to those responsible for the balance sheets and general financial arrangements of these places; its nine chapters and three appendixes give full explanations of the system, its origin and its many applications. The book should be consulted by all who have to keep the accounts or write the annual reports of charitable and other institutions of every description.

Dr. W. H. B. STODDART has written a short and excellent account of *Mental Nursing*,[7] intended to give a prospective mental nurse some idea of the work he or she contemplates. It is a practical guide to the nursing and management of insane persons, and contains no anatomical or physiological details. The book may be recommended to those for whom it has been written, and, indeed, will be found of great service by all who are brought into contact with insane or mentally deficient persons.

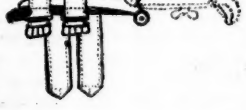
[6] *The Uniform System of Accounts for Hospitals and Public Institutions, Orphanages, Missionary Societies, Homes, Co-operations, and all Classes of Institutions.* By Sir H. Burdett, K.C.B., K.C.V.O. Fourth edition. London: The Scientific Press, Ltd. 1916. (Roy. 8vo, pp. 139. 5s. net.)

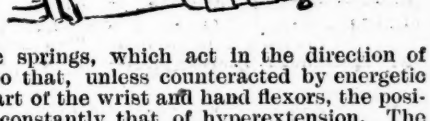
[7] *Mental Nursing.* By W. H. B. Stoddart, M.D., F.R.C.P. London: The Scientific Press, Ltd. 1916. (Cr. 8vo, pp 98. 2s. 6d. net, by post 2s. 9d.)

MEDICAL AND SURGICAL APPLIANCES.

A Splint for Drop-wrist.

THE skeleton hyperextension hand-splint and also the long hand-splint used by Lieutenant-Colonel Robert Jones were illustrated in the JOURNAL of January 16th, 1915, and more fully in the issue of December 16th, 1916, p. 833. Mr. Bryden Glendining, F.R.C.S., now sends us a description of a splint, the design for which was originally extemporized by Private D. O. Murton when a patient in the Duchess of Bedford's Woburn Military Hospital, for wrist-drop due to severance of the musculo-spiral nerve a little above the elbow by a piece of shrapnel casing. The splint, which is manufactured by the patient's firm, Henry A. Murton, Ltd., Newcastle-on-Tyne, is made of aluminium, and consists of (1) a wrist portion, moulded and shaped to adapt itself to the volar surface of the wrist and lower ends of the radius and ulna and attached by a webbing strap and buckle. (2) A palmar portion, which is shaped for the hand and is capable of being lengthened or shortened according to the size of the hand, according as one desires to carry the support to the metacarpo-phalangeal joint only or to the first interphalangeal joint; a fly-nut in the splint locks the sliding surfaces and fixes it at the required length. (3) Between the wrist and palmar sections the splint is hinged and fitted with two strong wire springs, which act in the direction of dorsal flexion; so that, unless counteracted by energetic action on the part of the wrist and hand flexors, the position assumed is constantly that of hyperextension. The support is not carried beyond the first interphalangeal joint, since it is beneficial for the patient to exercise the fingers by means of the lumbrical muscles. The main advantages claimed for the splint are its small bulk and lightness; it has been generally adopted in the hospital mentioned during the period preceding and following nerve suture.





OF 330,179 school children in the city of New York examined in 1914, there were found to be 194,207, or 58.8 per cent., suffering from defective teeth. This exceeded the sum total of all the other defects noted by nearly 80,000.

MOTOR NOTES FOR MEDICAL MEN.

BY H. MASSAC BUIST.

THE PETROL CONTROL COMMITTEE'S LATEST ANNOUNCEMENT.

THE Petrol Control Committee made an important announcement on Tuesday touching the necessity for economy on the one hand, and, on the other, intimating that no fresh licences will be granted. This is a practical fulfilment of the forecast made in these columns some months ago, wherein, while attention was drawn to the continued increase of petrol production in the world, the facts were, besides, weighed that the shipping problem would increase the longer the war continued and the motor fuel needs of the services would grow at an amazing rate.

Those factors have now begun to operate, with the result that the Petrol Control Committee has this week issued the notice in question. It concerns medical men chiefly by reason of the fact that the Committee will not be prepared to issue licences to applications received after Wednesday last, except where such applications were for the renewal of licences which had expired in the usual course. Considering that the notification only appeared in the press on Tuesday, the public was given a bare twenty-four hours' notice. Residents in some parts of the country could have had scarcely twelve hours' notice.

Only the small proportion of medical men who have not been using petrol, and who have therefore had no licences, will be needing them. But that proportion of medical men will need them urgently when the time comes, because the necessity will arise from the nature of the work they will then be undertaking. That work must therefore be regarded as of national importance; hence, while no official announcement has been made on the subject at the moment of writing, nevertheless it may be taken for granted that, on showing due cause, medical men not at present holding motor spirit licences will be granted them, since, if it should be necessary to accommodate them, there need be no renewal in April of licences to purely private motorists at present holding them. Indeed, something of this sort is forecast, in that the Committee states that it cannot undertake that they will be able to issue renewals on all applications received from holders of motor spirit licences. In any case it announces that it may be necessary to reduce the quantity of motor spirit at present allowed. The general public may take it for granted that this is only a preliminary intimation that such restrictions will be put into force, and that the case of the medical profession will certainly receive special treatment, in that it is already announced that every effort will be made to avoid disturbance of the existing arrangement under which the Committee receives applications, supported by Government departments, on the ground that the motor spirit is required for work being performed in the national interest. In the past the department concerned has made sundry announcements to the effect that it regards medical work as being of national importance. Therefore medical men have no reason to fear being put to further inconvenience, or having their work restricted to any greater extent, as a result of the latest order of the Petrol Control Committee.

OBTAINING SPARE PARTS.

In regard to some remarks of mine touching the advisability of medical men obtaining immediately such spare parts as are likely to be required for their cars owing to the fact that car-makers are no longer allowed to manufacture spare parts for civilian needs, a medical correspondent writes from Dorset that this advice is a counsel of perfection and of no practical utility. He proceeds to argue that one does not know what part of a car may go wrong, that one cannot stock expensive spares most of which will never be needed, and that "the different spare parts of a car costing £200 would cost at least half that amount." He therefore concludes that it is an absurd proposition to buy spare parts against eventualities. Certainly it would be if one proceeded on any such lines. But it was never suggested that one should. If a motor owner does not know what parts of an ordinary car wear out and need renewal from time to time he can either ask his fellow motorists, or the maker of the vehicle, or the agent from whom he may have bought it. A more or

less cursory examination, moreover, coupled with the amount of service the vehicle has done, will give him a shrewd notion of what is likely to be needed within a period of six months, or a year, beyond which my remarks were not intended to apply. They were based on the announcement prohibiting the making of spare parts, and on the obvious fact that most makers had at the time a certain stock of spare parts for at all up-to-date models, therefore early applicants could alone hope to secure specimens from any such stocks, for which there would arise—as, indeed, there has arisen—an immediate demand on the publication of the announcement in question. Moreover, it is quite idle to hope that the Ministry of Munitions can take any action in the matter of sanctioning the special production of spare parts for medical men, in that the motor manufacturing programme to which this nation is committed this year does not leave any margin for the production for other than spare parts for machinery in absolute use by the services. My advice was, therefore, in the nature of showing the medical man how to make the best of an awkward case.

As to its practicability, provided the stocks of the given spares have not yet been exhausted, there need be no objection on financial grounds. Nothing approximating to 50 per cent. of the cost of any car, as is imagined by the correspondent whose observations on the point I quoted above, is in question: 10 per cent. would be an outside margin; 5 per cent. would be handsome for most doctors.

What is the owner of a car likely to need? Suppose a car has done 12,000 miles, then it is likely that sooner or later one piston will be needed, perhaps two, and some new piston rings. The big ends may need taking up somewhat, but he is scarcely likely to need to have them relined. On the bad roads general nowadays shackle bolts sometimes wear considerably. So an extra cautious owner may like to have some of these, though they are examples of parts which could be obtained and adapted without going to the maker of the given car. On the other hand, a steering worm might be wanted, or a new bevel for the back axle. But these are both parts which could be examined sufficiently with comparatively little labour and time to enable it to be foretold whether or not spares would be needing for them within the next twelve months.

Indeed, at the time my remarks were made, and again to-day, I had not, and have not in mind, the timely expenditure by the medical motorist of more than five or ten pounds on the acquisition of such comparatively few spare parts as are likely to be required by him for his car, and as might have been obtainable at the time the original prohibition to manufacture spare parts was published. Of course, the likelihood of obtaining spare parts has very greatly decreased in the interval. Nevertheless, of the great number of parts that go with the making of a car, comparatively few wear. Of these, fewer still cannot be made to continue rendering service by the simple process of adjustment, as instance steering and big end details; while of what remain a certain proportion, as instance bolts, can be obtained at a pinch from other sources and adapted locally. Thus the long and the short of it is that in the ordinary course of wear in normal service the average medical motorist will not want more than half a dozen spare parts by him to make assurance doubly sure for a twelvemonth ahead.

Of course, some quite unexpected part may go. But I was not dealing with the problem of accidental breakdown, or of abnormal failure, against which no human foresight can provide, but with the proposition of the inevitable wear and tear of a car called on for continual service by a medical man in all weathers, and that problem is like that of maintaining an omnibus or taxicab. The big carrying corporations know to a nicety at what intervals of miles of service rendered clutch linings want renewal, breaks want relining, joints need taking up, and so forth. Likewise, the spare parts departments of all the big motor manufacturers know from mere demand over long periods what parts of each model made by the given firm are most in demand for renewals and replacements. They could, therefore, assist the medical client by giving him a brief answer to any question he cared to put to them touching his own car, provided that in the interval since my notes were published on the subject the stock of spare parts in question has not been exhausted.

THE MILITARY MEDICAL SERVICES IN 1916.

IN the BRITISH MEDICAL JOURNAL of January 2nd, 1915, and of January 15th, 1916, were published articles on the military medical services in 1914 and in 1915 dealing with the losses of the military medical services in the war. The present article continues the history of these services during twelve months of war in 1916.

The two former articles began with the consideration of the strength of these services, showing how greatly the numbers had expanded to meet the strain of war. As the *Army Lists* published since the middle of 1915 are not available to the public, that of June, 1915, having been the last issued for sale, any remarks on the strength in 1916 must be chiefly guesswork.

The following table shows the number killed, and died of wounds, died on service, wounded, missing, and prisoners, in each of the military medical services, during the year; also the number of honours conferred upon each service. It is believed that the numbers shown as killed are correct, but it is possible that a few names may have been omitted. The numbers shown as wounded are doubtless not quite exact, but they are approximately correct. It may be mentioned that many of those who have been reported as having died of wounds have previously been returned as wounded; while most of those reported as missing have subsequently been accounted for as killed or prisoners. There is, therefore, a certain amount of overlapping under all heads. During the greater part of the year the official lists have not mentioned the seat of war in which casualties took place. It may be assumed, however, that the great majority of the casualties in the various branches of the R.A.M.C. took place in the long-drawn-out battle of the Somme, or battle of Picardy, which lasted for just half the year, from July 1st to the end of the year.

The total number of medical officers killed in 1914 (five months) was 46, of whom 13 belonged to the navy and 33 to the other military services. In 1915 the numbers rose to 97—14 naval, 3 of the mercantile marine, and 80 of the other military services, besides 12 medical men serving as combatants. In 1916 the numbers reached 149, of whom 33 belonged to the navy and 114 to the other military services. 1 colonial services, 1 surgeon in mercantile marine, besides 15 medical men serving as combatant officers. Of these, no fewer than 73 were temporary officers of the R.A.M.C. To these should be added the names of nearly a hundred medical officers who have died while serving, making a total medical roll of honour of 260.

TABLE I.—*Casualties and Honours, 1916.*

	Killed and Died of Wounds.	Died.	Wounded.	Missing.	Prisoners.	Honours.
Royal Navy	33	4	3	1	2	21
R.A.M.C.	5	4	10	3	14	163
R.A.M.C.(S.R.)	9	2	34	—	—	56
R.A.M.C.(T.F.)	9	18	40	3	—	68
R.A.M.C. (temporary)	73	41	271	2	1	248
Australian A.M.C. ...	4	2	—	—	—	30
New Zealand M.C. ...	4	—	6	—	—	4
Canadian A.M.C. ...	4	4	19	2	2	33
South African M.C. ...	—	4	3	—	1	2
I.M.S.	1	15	7	—	25	46
I.S.M.D.	5	2	3	—	12	5
Combatants	13	—	—	—	—	—
Miscellaneous	2	2	—	—	—	—
Total	162	98	396	11	57	676

THE ROYAL NAVY.

The number of medical officers of the navy on the active list would seem to have slightly decreased owing to casualties; no official list of new appointments appears to

have been published. This decrease is more than counterbalanced by the number of appointments of temporary surgeons made during the year.

During 1915 fourteen medical officers of the Royal Navy were killed in action or lost with their ships. That number has been more than doubled in 1916. The chief losses took place in the battle of Jutland, which accounted for twenty-one. Two were lost in H.M.S. *Russell*, three in H.M.S. *Hampshire*, in which Lord Kitchener perished, and three were killed in the battle of the Somme. A few were lost in smaller ships. The names are as follows:

Killed.—Fleet Surgeons W. Center, F. F. Lobb, W. J. Bearblock, H. L. Norris, F. A. Capps, H. L. Geoghegan, P. G. Williams; Surgeons P. D. Pickles, S. H. Punch, J. D. Ward; Temporary Surgeons C. W. Lewis, M. H. de J. Harper, C. O. H. Jones, G. Shorland, A. A. Morrison, F. W. T. Clemens, G. M. Johnson, T. M. Wood Robinson, J. S. D. Macformac, G. B. Moore, H. G. Chaplin, H. F. McNally, H. C. Gow, G. A. Walker; Surgeon Probationers J. Johnston, J. E. Macintyre, R. Walker, D. H. Ferris, H. J. Dingle, J. Hislop, G. S. Freeman, A. L. Strachan, W. S. Allardice.

Died.—Deputy Surgeon-General C. J. Mansfield, Staff Surgeon J. K. Murphy, R.N.V.R., Temporary Surgeon W. H. Edmunds, Surgeon-Probationer J. Hughes (as a prisoner of war).

The number of honours conferred on medical officers of the navy, and indeed on officers of the navy generally, has not been large. The contrast between the number of decorations bestowed on the members of the great silent service and on those of the army is indeed striking. The figures are given in the tables.

THE R.A.M.C.

As stated above, any consideration of the numbers must be chiefly guesswork.

For the regular R.A.M.C. the numbers have fallen slightly owing to the occurrence of casualties and the fact that no new appointments have been made.*

The Special Reserve and Territorial Force casualties by death have amounted to 11 and 27 respectively; while the number of new appointments have probably been larger, so that the strength of both branches of the service may have risen considerably.

The temporary officers of the R.A.M.C. have suffered no less than 114 death casualties (73 killed and 41 died), to which must be added a large number of resignations, partly on completion of the stipulated one year's term of service, and partly on account of ill health. On the other hand, the number of new appointments must have far more than counterbalanced these deductions, and the strength must have increased considerably.

As regards the numbers of the Colonial medical services we have no information.

The military medical officers killed have been almost entirely men of junior rank. Out of a total of 162 deaths in action only six were of officers above the rank of captain, and of these three belonged to the Colonial forces.

It is, of course, only natural that the junior officers should furnish the great majority of these deaths. Not only are they numerically greatly in excess of the seniors, but also the medical officers most exposed to danger at the front, serving with regiments and in advanced dressing stations, are chiefly officers of the rank of captain and lieutenant.

With regard to those who have died on service, it is in many cases impossible to say whether individuals have or have not recently returned from active service. Many, doubtless, had not been out of England. But a large number, probably the majority, have either been men recently invalided from the front, or have died while actually serving abroad.

The names of the officers who have been killed and who have died are as follows:

R.A.M.C.

Killed.—Lieutenant-Colonel H. B. Connell; Major P. A. Lloyd Jones, D.S.O.; Captains G. P. Selby, C. M. Nicol, B. J. L. Fayle.

Died.—Majors R. S. Smyth, F. C. Lambert, N. E. J. Harding; Captain A. G. Jones.

R.A.M.C.(S.R.).

Killed.—Captains T. E. Guthrie, A. M. Thomson, G. Stanton, M. P. Inglis, J. Deighton, A. T. Logan, T. C. Kidner, O. G. Parry-Jones, J. O'Brien.

Died.—Captains W. H. Nicholls, W. Crymble.

* A large number of new appointments were gazetted on January 10th, 1917.

R.A.M.C.(T.F.).

Killed.—Captains J. L. Green, V.C., A. P. Low, J. H. Beilby, G. R. Hitchin, O. H. Peters, T. C. Houston, S. Clark, G. M. Levack, G. H. Watson.

Died.—Colonel J. Harper; Lieutenant-Colonels M. W. O'Connor, J. W. Stokes, S. Boyd, A. H. Lister; Majors F. R. Miller, W. L. Hawkesley, E. Brice, C. H. Benham, J. Hepple (drowned); Captains P. B. Ridge, J. T. Leon, R. Donald, R. R. J. Holmes, E. B. Hartnell, E. Bell (drowned), H. R. Robertson, M. C. Hayward.

R.A.M.C. (TEMPORARY).

Killed.—Lieutenant-Colonel A. N. Walker; Captains R. W. Duncan, A. C. A. Jekyll, J. Wilson, W. S. Armstrong, K. H. A. Kellie, H. C. Mulkern, J. C. Rix, D. W. Smith, G. O. Maw, F. L. Cleland, E. W. Lawrence, R. W. Michell, G. R. Heard, H. G. Morris, J. H. D. Acland, W. G. Shand, H. R. Knowles, D. H. D. Wooderson, A. J. Waugh, J. M. Stenhouse, D. B. Maclean, H. H. Proudfoot, W. N. Watson, G. S. Miller, A. W. Harvey, N. Broughton, W. Campbell, C. E. H. Smith, E. P. Leahy, R. J. Wooster, M. Peto, F. S. Walcott, E. R. Welch, T. L. Ingram, A. W. Venables, R. E. Harkins, M. T. Rees, W. R. Pagen, H. Matthewson, H. E. O'Brien, J. D. Forrester, H. Begg, I. A. M. Clarke, I. M. Brown, C. K. McKerrow; Lieutenants W. F. Thompson, W. W. Deans, A. N. Garrod, G. Dewar, F. S. Mitchell, B. B. Gough, M. E. Ball, J. M. Johnston, A. Booth, J. B. Haverson, E. C. Lambert, D. Rodger, W. R. Wilson, C. P. Kelly, R. Jones, R. F. T. Newbery, B. R. Roberts, E. H. McVicker, W. L. Evans, M. W. Loy, W. S. Lacey, S. A. Walker, W. C. E. Bower, J. Cropper (lost in *Britannic*), E. Howe, J. R. Brown, G. W. Guthrie.

Died.—Colonels A. E. J. Barker, Sir Victor Horsley (Mesopotamia), C. Stonham; Lieutenant-Colonels Sir C. Ball, Sir S. F. Eve; Majors G. H. Melville Dunlop, A. H. Benson; Captains P. Pattison, A. T. Campbell, H. J. R. Jones, A. R. Chavasse, G. F. Barr, F. F. German, R. K. MacGregor (accidentally killed), E. C. Austin, A. Seabrooke, H. H. Tanner (drowned), H. F. G. Noyes, T. Strain (accidentally killed), D. T. C. Frew, D. Gilmour, V. J. Ruttledge, L. A. Arnould; Lieutenants J. Le K. Maverty, W. H. Macdonald, F. G. Hopkins, R. G. Brown, W. W. K. Duncan, P. H. Berry, G. N. Murphy, J. J. Mackintosh, G. V. Fletcher, A. L. Thornley, H. J. S. Kimball, H. R. Griffiths, G. S. Graham, J. St. J. Dundon, S. W. Burrell, W. W. Farrer, F. Whitaker, W. D. Murray.

AUSTRALIAN A.M.C.

Killed.—Captains J. G. Mackenzie, S. M. Graham, H. F. Plant, R. F. Hugues.

Died.—Lieutenant-Colonel H. K. Bean; Captain E. W. Deane.

NEW ZEALAND M.C.

Killed.—Major A. Martin; Captains G. H. Wood, G. V. Bogle, F. Hitchcock.

CANADIAN A.M.C.

Killed.—Lieutenant-Colonels A. W. Tanner, R. P. Campbell; Captains D. Waterston, P. J. Walsh.

Died.—Lieutenant-Colonels H. B. Yates, H. R. Duff; Major A. V. Becher; Captain N. J. L. Yellowlees.

SOUTH AFRICAN M.C.

Died.—Major P. A. Gillespie; Captains W. Gem, N. J. Hofmeyr, A. Groenwald.

Wounded.—The number of medical officers returned as wounded in 1915 was 224. These figures have been far exceeded in 1916, the number of temporary officers of the R.A.M.C. wounded in 1916 is greater than the total for 1915. In both cases the totals are probably not quite correct, but are approximately so. A good many officers first returned as wounded subsequently died of their wounds. And in a few cases the same officer has been wounded more than once during the year. The numbers wounded in each of the different medical services are shown in the table.

Missing.—The number shown as missing, in the table, is not large. Most of them were subsequently accounted for, either as killed or as prisoners.

Prisoners.—The numbers of medical officers of the different services taken prisoners are shown in the table. Almost all, 50 out of 57, were taken in the surrender of General Townshend's force at Kut on April 30th. Many of them have since been released or exchanged.

HONOURS.

The various honours bestowed upon members of the different medical services during the year are shown in Table II. The honours gazetted on January 1st, 1917 (221), are not included.

TABLE II.—*Honours, 1916.*

	V.C.	C.B.	K.C.M.G.	C.M.G.	C.I.E.	D.S.Cross	D.S.O.	Bar to D.S.O.	Military Cross	Bar to Mily Cross	Foreign.	Total.
R.N.	—	6	—	2	—	10	—	—	—	—	3	21
R.A.M.C.	—	17	1	39	1	—	52	—	36	—	17	163
R.A.M.C.(S.R.) ...	—	—	—	—	—	—	4	—	50	—	2	56
R.A.M.C.(T.F.) ...	3	3	—	12	—	—	13	—	33	—	4	68
R.A.M.C.(temp.)	—	10	—	9	—	—	17	1	181	8[a]	22	248
Australian A.M.C.	—	2	1	4	—	—	3	—	19	—	1	30
New Zealand M.C.	—	—	—	2	—	—	—	—	2	—	—	4
Canadian A.M.C.	—	—	—	8	—	—	3	—	19	1	2	33
S. African M.C. ...	—	—	—	—	—	—	—	—	2	—	—	2
I.M.S.	1	2	—	3	4	—	13	—	22[b]	—	1	46
I.S.M.D.	—	—		—	—	—	—	—	5	—	—	5
Total	4	40	2	79	5	10	105	1	369	9	52	676

(*a*) One temporary R.A.M.C. officer gained a second bar to his Military Cross.
(*b*) One temporary lieutenant in the I.M.S. gained the Military Cross.

As the total numbers of the different services are not known, nothing can be said about the proportion of honours granted to each service, except that the very small number of honours bestowed upon the Navy is a noticeable feature. The most coveted honour of all, the Victoria Cross, has been granted to four medical officers during the year; three out of the four, Captains J. L. Green (killed), W. B. Allen, and N. G. Chavasse, were Territorials.

SONS OF MEDICAL MEN.

The names of over 200 sons of medical men killed in action during the latter half of 1915, were published in the BRITISH MEDICAL JOURNAL last year. Nearly double that number (385) have been noted in 1916. Even so the figures, especially those for the Colonial contingents, are probably far from complete.

MEDICAL STUDENTS.

The number noted, excluding those who were also sons of medical men, and included under that heading, has only been some 57 during the year, a number not much larger than those given for the latter half of 1915. Here also, however, the figures are probably very incomplete.

NURSES.

No nurse appears to have been reported as killed. But five have been shown in the casualty returns as wounded, and a large number have died on service—many in France, a few at Salonica and in Mesopotamia. No nurse was reported as lost in a torpedoed hospital ship during 1916, though eleven lost their lives in this way at sea during 1915.

COMBATANTS.

At least eight medical men and five dental surgeons, serving as combatants, were killed during 1916. The names are:

Medical Men.—Lieutenant-Colonel G. O. Moorhead, South African Infantry; Captains H. S. Monkham, Canadian Mounted Rifles; G. S. Stritch, Connaught Rangers; H. K. Birley, Manchesters; R. M. Dennys, Loyal North Lancs Regiment; G. Mowat, South African Infantry; Lieutenant J. T. Waite, The Buffs; Lance-Corporal R. G. C. Stewart, Canadian Infantry.

Dental Surgeons.—Major V. L. S. Beckett, East Yorkshire Regiment; Captains E. H. Wyand, King's Royal Rifle Corps; A. B. Tough, East Lancs Regiment; Second Lieutenants C. F. Snow, Royal Field Artillery; J. S. Palmer, Durham Light Infantry.

THE INDIAN MEDICAL SERVICE.

This service has just about maintained its normal strength of a little under 800. Some twenty appointments to the service have been made by nomination during the year, and this counterbalances the wastage by death and by a few retirements on account of age or ill health.

The number of temporary officers, which stood at about 130 at the beginning of 1916, has probably almost, if not quite, doubled. There have been a few deaths, and some resignations; also a few have been confirmed as permanent officers; while a large number of new appointments have been made.

With the closing of the hospitals for sick and wounded Indian troops at Brighton, Bournemouth, and Brockenhurst at the end of 1915 and beginning of 1916 the personnel of the Indian general hospitals serving in England were recalled to the East, and the employment of retired officers of the Indian Medical Service in these hospitals ceased. A number of these retired officers returned to India for temporary re-employment, while a considerable number were employed by the War Office in England, some in hospitals for British troops, some on administrative work, such as that of recruiting medical boards.

Only one officer of the Indian Medical Service was killed in action in 1916—Captain A. R. S. Alexander, in Mesopotamia. Some twelve officers on the active list died—one in Egypt, two in Mesopotamia. Colonel A. H. Moorhead, who died in England, had recently been invalided from the front in France. Of the three retired officers who died on duty, one had recently been serving in France, a second died in Mesopotamia; the third had not been abroad. The names are:

Killed.—Captain A. R. S. Alexander.
Died.—Colonels B. B. Grayfoot, C.B. (Egypt), A. H. Moorhead; Lieutenant-Colonels G. F. Braide, C. B. Prall, F. C. Pereira, C. Monk (retired), P. C. Gabbett (retired, Mesopotamia), W. Selby, E. Hudson, C. S. Rundle (retired); Captains J. D. Wilson, F. H. Hebbert (Mesopotamia), R. I. Binning (Mesopotamia); Temporary Lieutenants G. S. Engineer, P. K. Wariyar.

The number of wounded has been small, only seven or eight. Some twenty five were taken prisoners at Kut, many of whom have since been released.

The number of honours shown in the table above is 46. This number includes a Victoria Cross, gained by Captain J. A. Sinton. Only twice before, in sixty years, has the V.C. been bestowed on an officer of the I.M.S.; on Surgeon, now Colonel Crimmin, C.B., in Burma, in 1858; and on the late Captain H. F. Whitchurch, in the defence of Chitral, in 1895.

THE INDIAN SUBORDINATE MEDICAL SERVICE.

Five members of the I.S.M.D. have been killed; Assistant Surgeon W. J. Maine, M.C., lost in the *Maloja;* and Assistant Surgeons A. R. Emmett, A. C. Marchant, G. C. West, and P. C. de Cruz—all in East Africa. Only two names have been noted as having died on duty: Assistant Surgeons J. V. Fernandez (Mesopotamia), and E. C. Hallums. Probably the number who have died is really larger.

This service has received five Military Crosses. Three members have been wounded, while at least twelve were taken at Kut.

THE OVERSEAS MEDICAL SERVICES.

Members of the different African Colonial Medical Services must have taken part in the campaign in German East Africa. But the only casualty reported among them was the death of Captain W. Hillbrook, of the Congo Carrier Corps.

Some of the younger members of these services have joined the R.A.M.C. as temporary officers, and one at least, Lieutenant W. C. E. Bower, of the West African Medical Staff, has been killed in action. Temporary Lieutenant F. G. Hopkins, R.A.M.C., who died in England, was also an ex-officer of this service, who had been Principal Medical Officer on the Gold Coast; and Lieutenant J. T. Waite, of the Buffs, killed in action, had also served for some time in the W.A.M.S.

Dr. W. K. Miley, the senior officer of the Indo-Colonial Emigration Service, was lost in the *Maloja*.

THE MERCANTILE MARINE.

A large number of British ships have been torpedoed and sunk by German submarines during 1916, many of them large passenger-liners, in some cases with great loss of life. Many losses among the medical officers of the mercantile marine might have been expected. The only one, however, which we have seen reported was the death of the surgeon of the Ellerman liner *City of Birmingham*, torpedoed towards the end of November. His name was not published. Dr. J. E. Parker, surgeon of the transport *Ivernia*, sunk on January 1st, was also lost.

Surgeon E. W. Welchman, of the Admiralty Transport Service, also died during the year

British Medical Journal.

SATURDAY, JANUARY 27TH, 1917.

CARRIERS OF AMOEBIC DYSENTERY.

THE Medical Research Committee has issued a very valuable report on amoebic dysentery and the protozoological investigation of cases and carriers,[1] by Mr. Clifford Dobell, M.A., Lecturer in Protistology in the Imperial College of Science. In an introduction prefixed to the report by the Committee, the circumstances under which it took part in the organization of pathological work in this country in relation to the dysentery patients and convalescents received from the Mediterranean during and after the autumn of 1915 are related. When the influx of invalided men began no organization staffed and equipped for the diagnosis of protozoal infections existed, and the number of persons available competent to make the requisite examinations and to produce records of scientific value was very small in relation to the sudden call for this particular kind of skill and knowledge. Moreover, the bacteriological examination of the faeces, which was not less important, proved more than sufficient to occupy the time of the whole pathological staff of the hospitals concerned. In these circumstances it was determined to make use of the services of well-trained workers in extra-medical departments of biology, and to set them, after a relatively brief training in protozoal work, to supply the need. The War Office agreed to arrange for the concentration of patients suffering from or convalescent after dysentery in a limited number of centres, and it was arranged in certain of these to submit groups as large as possible to complete examination. Though for various reasons the plan did not work at as large a number of centres as was hoped, nevertheless the protozoal records from certain centres dealt with a sufficient number of cases to make it probable that valuable information could be got from them by careful analytical study, and it was for this reason that the reports were placed in the hands of Mr. Clifford Dobell.

His task was difficult, for the material on which he had to work was of unequal value, and the field of investigation itself is comparatively new, so that methods in it are neither so fully standardized, nor the canons of interpretation so much a matter of general agreement as is the case with bacteriology. He has produced an essay which, though many of its conclusions may be superseded, will remain of permanent value as a contribution to the literature of the subject. When the investigations made for it were begun there was an almost complete lack of information as to the significance to be attached to a negative examination—that is, to failure at any one examination to detect the presence of a particular parasite. A purely arbitrary standard of freedom from infection with *Entamoeba histolytica* was therefore laid down by the War Office as a practical necessity; it was not found possible in fixing it to take into account the relation in time of the examinations to the period of treatment with emetine, and this was an additional detriment to the scientific value of the material. It must be remembered, however, that the primary object of the examinations was to test the presence of infection and the results of treatment with a view to restoring sick or dangerously infective men to health and safety, and to fit them for duty. Mr. Dobell gives it as his opinion that negative examinations have no value unless made by a person who has had special training and experience, and that even then they are not to be relied upon absolutely. Personal error cannot be excluded from any single negative examination. Still, speaking generally, he finds it safe to assert that the greater the skill of the examiner and the number of negative examinations made in any particular case, the greater is the value of that examination for that case. When the skill of the examiner and the number of examinations are reduced to the minimum the negative examination ceases to have any value as evidence.

To the evidence supposed to incriminate *Giardia* (*Lamblia*) *intestinalis* in connexion with some types of intestinal disorder Mr. Dobell does not attach much weight, and whatever their opinion on this point all will admit the special importance of *Entamoeba histolytica*. It is his analysis of the observations accumulated with regard to this parasite that gives special value to Mr. Dobell's essay.

Even in the case of specially trained observers the amount of examination possible to be given to each patient was insufficient for the discovery of all cases of infection, and it is practically certain that in many centres the number of carriers of *E. histolytica* discovered has been but a small fraction of the number actually carrying the infection. He considers, however, that an increase of the number of examinations would result in the detection of all but a few of the cases, given the requisite special experience and skill on the part of the examiner. The examination of men who had been in Egypt or Gallipoli and had been invalided for causes other than dysentery without any history of this or other intestinal disorder, led to the rather disquieting discovery that the proportion of carriers of *E. histolytica* among the small number of non-dysenteric patients thus examined was not below that among the men convalescent from dysentery or enteritis.

The conclusion Mr. Dobell reaches is that the proportion of individuals still infected with *E. histolytica* among the convalescents from intestinal disorders reaching this country from the Mediterranean area has been about 18 to 25 per cent. of the whole number. If it be assumed that carriers of this parasite would be found in a proportion of this order throughout the whole body of troops which had been similarly exposed to the infection, it is evident that its eradication is a national problem of great magnitude, as well as of much importance.

Mr. Dobell's conclusions as to the results of the treatment hitherto applied, namely, by hypodermic injections of emetine, are disappointing. He shows that the criterion of cure—that is to say, of eradication of the infection by treatment—laid down on the basis of the best experience available at the time when the scheme was started was seriously deficient in two directions: in the first place, the number of negative examinations accepted as indicative of permanent freedom from infection was much too small; in the second place, negative examinations made during a period of treatment with emetine were accepted as evidence of cure, whereas it has been established that evidence of infection is usually unobtainable during such a period, even in cases

[1] London, H.M Stationery Office. To be obtained through any bookseller. Price 1s. 6d. net.

in which infection returns as soon as treatment is suspended. A study of a selected set of cases in which it was possible to repeat the examination sufficiently often after the conclusion of a course of treatment by hypodermic injections of emetine showed that only in a small minority, not more than about one third, was a permanent cure obtained. As a matter of fact the proportion of carriers discovered in the convalescent dépôts among patients discharged from the hospitals as cured did not differ widely from that found among fresh arrivals who had received no treatment in this country.

His analysis of the evidence as to the efficacy of treatment by the double iodide of emetine and bismuth encourages the hope that the method will result in the permanent cure of a large majority of the patients in a relatively short time. An account of the nature and mode of administration of this drug, which is given by the mouth, will be found in the issue of this JOURNAL of November 4th, 1916 (p. 613), in a paper by Mr. Dobell, and in a leading article (p. 626). Mr. Dobell's present conclusions on the matter are that this double salt properly administered has successfully cured the majority of carriers of *E. histolytica* hitherto treated by it, but that in acute dysentery, though the results have been very satisfactory, further trials are necessary. He points out that for treatment to be successful the drug must be given in large quantities; not less than 36 to 40 grains in daily doses of 3 or 4 grains; less than that amount is seldom efficacious, and more may be necessary in individual cases. He further states that emetine administered in this form has generally been successful, even when previous treatment with hypodermic injections of emetine hydrochloride have failed. The drug may exceptionally succeed in removing an infection with *Entamoeba coli*, but neither it nor any known method of treatment seems to have any influence in removing flagellate infections (Lamblia, Trichomonas, Chilomastix).

THE REMOVAL OF FOREIGN BODIES FROM THE EYE BY MAGNETS.

IN the first number of the *British Journal of Ophthalmology*[1] there appear three papers on this subject, each written by men who have large and recent experience in the treatment of foreign bodies within the eye.

Mr. G. H. Pooley, who meets with large numbers of industrial accidents in Sheffield, states that experience has led him to depart from the technique advocated by Haab, whose giant core magnet he still uses. He insists on careful localization of the foreign body. "Three or four days' wait makes no difference to the result." The extraction is performed by two routes, and the choice between them determined by the state of the lens. If the lens is badly wounded so that it must become cataractous, and the foreign body is just behind it, the lens is removed, and then the foreign body, by drawing it into the anterior chamber. If the lens is not wounded, or only slightly, the foreign body is removed through an incision into the sclera behind the ciliary body; the point of the giant magnet is placed upon, or just introduced into, the incision. Extraction through the sclera, he says, "gives the best results." He insists on the necessity of avoiding "tidal pulls," tugging on the ciliary body, bruising of tissues, and particularly the lens, as must too often happen with extraction through the pupil. For the scleral route he claims a larger percentage of eyes saved, better visual acuity, shorter convalescence.

In the second paper Captain Maurice H. Whiting, R.A.M.C. (temp.), and Lieutenant Charles Goulden, R.A.M.C. (temp.), who had both had considerable experience in this work before the war, have very greatly increased it during the war. In July, 1916, alone they had to deal with thirty cases of magnetic foreign bodies within the globe. They adhere to what is essentially the technique of Haab. The foreign body is localized by *x*-rays, though they do not consider this essential to successful treatment, and consider that if the localization is likely to involve "delay of more than two or three hours it should be omitted." They use the giant Haab magnet and the smaller Snell magnet. The route they prefer is round the lens through the suspensory ligament, and through the pupil into the anterior chamber, whence the foreign body is removed by incision and the use of the small magnet. They describe at length the variations of current and so of magnetic pull used to coax the unwilling tenant to move, and the manipulative manœuvres necessary to ease it on the way out.

The third paper is by Mr. Harrison Butler of Birmingham, who, like Mr. Pooley, has wide industrial experience. In his practice the giant Haab and the small Snell are replaced by the ring magnet designed by Mellinger of Basle, introduced into this country by Mr. A. S. Percival of Newcastle, and now made in somewhat improved form by Weiss of London.

In core magnets such as Haab's the magnetic force radiates so that the tractive force rapidly falls off as the distance increases. With the ring magnet the lines of force derived from the solenoid lie parallel, so that the tractive force is great along the central axis at right angles to the plane of the ring. With this instrument no minor magnet is necessary to get into the eye where the big Haab cannot enter. Rods, even spatulae, of soft iron can be placed on the solenoid and be manipulated therefrom into the eye itself. A further advantage is that the patient lies on the ordinary operation table, and the ring magnet is placed as a frame over his face and the operation proceeds. There is none of the contortions of patient and operator necessitated by the unwieldy Haab, which were often suggestive of some process of the Inquisition. Mr. Butler relies on *x*-ray localization, and has a second photograph taken after an extraction lest there be a second foreign body. He uses both corneal and scleral routes for extraction, the choice depending on the circumstances of the particular case. He insists on the perfect control and clean extractions secured by the ring magnet, but he points out the necessity for the eye being in the centre of the ring otherwise there is no current; and adds a caution to the inexperienced on the powerful traction exerted by the instrument.

In the BRITISH MEDICAL JOURNAL of January 20th (p. 81) a paper by Dr. Kelsall of Perth, Western Australia, was published. He gave details of two cases of removal of foreign bodies from the posterior chamber. In each case the body was accurately localized by *x*-ray pictures, and removed by the Haab magnet by the posterior route through incisions into the sclerotic. In neither case was vitreous lost, and the wound was closed by suture of the conjunctiva. Dr. Kelsall adds that "the future may naturally involve degeneration and other changes." That is a point on which careful and extended observations are very desirable.

[1] *British Journal of Ophthalmology*, vol. i, No. 1, January, 1917. London: G. Pulman and Sons. Price 4s. net., or 31s. 6d. per annum.

SIR ALFRED KEOGH, G.C.B.

FOR services rendered in connexion with the war the King has promoted General Sir William Robertson, chief of the Imperial General Staff, and Surgeon-General Sir Alfred Keogh, Director-General Army Medical Services at home, to be Knights Grand Cross of the Most Honourable Order of the Bath. The Grand Cross of the Bath is, perhaps, the highest distinction conferred by the Crown on a soldier, and we believe that we are right in saying that this is the first occasion in the long history of the Order—since its establishment in 1725 and its reinstitution in three classes in 1815, "to commemorate the auspicious termination of the long and arduous contest in which the empire has been engaged"—on which the Grand Cross has been conferred on a medical officer. We very heartily congratulate Sir Alfred Keogh and the service to which he has lent distinction on so conspicuous a recognition of his great services. When in October, 1914, it was determined that the Director-General, Sir Arthur Sloggett, should proceed to France in that capacity, Sir Alfred Keogh, who had become the Rector of the Imperial College of Science and Technology, was brought back to the chair in the War Office, which he had filled from 1904 to 1910. The task he then had to face was one of great magnitude and difficulty. Nearly all the officers on the active list of the regular R.A.M.C. were required for service abroad. The officers of the Territorial R.A.M.C. were required for their allotted duties with the Territorial Force, which had rapidly been placed on a war footing. The new armies required a new corps of medical officers, and Sir Alfred Keogh appealed for volunteers. A whole new organization had to be called into existence, and that this proved possible of accomplishment was due to the splendid response of the civilian medical profession of all ages, and engaged in all departments of practice; but this response would not have been what it was had not the profession felt the fullest confidence in Sir Alfred Keogh's organizing power, openness of mind, energy, and patriotic enthusiasm. The honours list in the *Gazette* of January 24th is largely a home list, and we are glad to see recognition accorded to many of those who, as consulting physicians and surgeons, have in various ways so ably seconded the efforts of the Director-General at home. The distinction of C.B. is conferred upon Colonel Robert Jones, inspector of military orthopaedics; on Lieutenant-Colonels T. H. Openshaw, C.M.G., Gilbert Barling, Sir Thomas Myles, Sir William Arbuthnot Lane, James Swain, Sir Berkeley Moynihan, Consulting Surgeons; on Lieutenant-Colonels Henry Davy and Aldren Turner, Consulting Physicians; on Lieutenant-Colonel P. J. Freyer, I.M.S., Consulting Surgeon to Queen Alexandra Military Hospital; and on Colonel D. J. Mackintosh, M.V.O., A.M.S., Territorial Force Reserve. The distinction of C.M.G. is conferred on Lieutenant-Colonel Bruce Porter, Commandant of the 3rd London Territorial General Hospital; honorary Lieutenant-Colonel J. Lynn Thomas, C.B., Consulting Surgeon to the Western Command; and Major G. Lovell Gulland, Professor of Medicine in the University of Edinburgh, who served as Consulting Physician to the forces in the Mediterranean. Well-earned promotion to K.C.B. is received by Surgeon-General N. R. Howse, V.C., C.B., Australian Army Medical Corps, and by Surgeon General William Donovan, C.B., A.M.S. The C.B. is received by the following officers of the A.M.S.: Surgeon-General W. W. Kenny, Colonels Edward North, W. H. Horrocks, C. C. Reilly, and James Thomson; and the C.M.G. by the following officers of the A.M.S. and the R.A.M.C.: Surgeon-General G. D. Bourke, C.B., Lieutenant-Colonels W. W. Pope, G. E. Twiss, G. B. Stanistreet, R. S. H. Fuhr, and H. P. W. Barrow; and also by Colonel the Hon. W. E. Collins of the New Zealand Medical Corps.

THE MILITARY MEDICAL SERVICES IN 1916.

AN article on the medical services of the navy and armies in 1916 is published at p. 124. As was the case with similar articles published in 1915 and 1916, the facts are founded on those recorded in the *Gazettes* and extracted in our own columns during the year. Nobody who has not attempted such an analysis can be fully aware of the difficulties in the way of making it absolutely accurate, and we cannot hope that we have overcome them all. We would appeal to officers and their relatives to send us corrections of any errors or omissions they may observe. As was to be expected, the number of casualties recorded during 1916 was considerably greater than the number in 1915. The total number killed in 1915 was 97; to these must be added 21 who died by disease or accident, making a total of 118. In 1916 the number killed reached 149, to whom must be added 98 who died on service or shortly after leaving, making a total of 247. In addition, a considerable number of medical men have been killed or have died of wounds while holding combatant commissions. The number was 13 last year and 12 in 1915. Of the total number of casualties in the Royal Navy, a disproportionate number—33 out of 43—were killed or died of wounds, but this disproportion is probably true of the navy as a whole, as is also perhaps the relatively small number of honours received by the senior service. Among army medical officers the heaviest toll both in killed and wounded has been paid by those holding temporary commissions. This was, of course, to be expected, having regard to their number and the advanced positions in which so many of them work. On the other hand, of the total number of honours given, 248 have gone to officers holding temporary commissions, R.A.M.C. The officers of the Special Reserve have received 56 honours, which, having regard to their number, may be taken to afford evidence of the excellent work they must have done. Territorial medical officers have received 68 honours, possibly a small proportion, but as a set-off, that most honourable branch of the medical service has the proud distinction of having won three Victoria Crosses, the recipients being Captain W. B. Allen, Captain N. G. Chavasse, and Captain J. L. Green; the last named was killed. The only other V.C. awarded to a medical officer was won by Captain J. A. Sinton, of the Indian Medical Service. We fear that the analysis published may be particularly defective in respect of the overseas medical services; it is not always possible from the *Gazette* to identify officers as belonging to these services, and in this matter, as in others affecting the accuracy of the analysis, we would appeal to the assistance of our readers. The list, imperfect though it may be, will be regarded with pride by the medical profession. It will mourn the many losses and will rejoice in the honours. It is consoled for the one by the knowledge that the military medical services of the country have taken their rightful place and won full recognition as one of the most efficient of the special branches of the army and navy; and it sees in the other proof that the personal qualities—the courage and ability—displayed on so many fields have not failed to receive recognition from the Crown.

THE TREATMENT AND TRAINING OF DISABLED SOLDIERS.

DR. R. FORTESCUE FOX has been induced by the note on this subject published last week to send us some impressions he received during a recent visit to the chief centres for physical treatment and training in northern France. He tells us that the medical administrators at the two chief Belgian Government institutions (Bons Secours for physical treatment, and Port-Villez mainly for training) and at the French centres in the military government of Paris emphatically express the opinion that it is necessary

to provide both treatment and training at one and the same time, and over a period of several months. They hold that only so can the mind and body of the soldier be healthfully occupied, and the completest possible restoration effected. This applies not only to the workshops for industrial training, and the class-rooms for intellectuals, but to places of agricultural training like Juvisy. Sir Henry Norman has stated in a recent report that a great saving to the state results in France from a systematic course of physical treatment being given to all disabled soldiers before the final adjustment of pensions. Dr. Fox reminds us that facts bearing on this point were set forth in detail in a report made last year by a committee of the Royal Society of Medicine; the figures in that report were lower than those given by Sir Henry Norman, but, calculated on them, the sum which will eventually be saved to the State by training soldiers before they are pensioned or discharged would run into many millions, and be spread over a generation. On the financial side, therefore, a successful handling of the problem would mean a war economy of importance, but to medical men the very large saving of suffering and disability, and the very large economy in man-power will be an even more powerful argument. Wherever it has been possible to put the plan into operation on an adequate scale, the results have been highly satisfactory not only in France, but also in this country, where more has been accomplished in this direction than is perhaps generally known. Improvements are constantly being introduced and the scheme extended in many directions. Much in respect of extension, of course, remains to be done, and the manner in which the men can best be brought under treatment is still subject to discussion. On this point Dr. Fox says: "The extra-military method presents, as you have stated, the great difficulty of providing special institutions and a medical staff; but it also involves the equally serious problem, to which you have not referred, of gathering once more together into centres for indoor or outdoor treatment and re-education, and for a period of several months, large numbers of men who are freed from discipline and anxious to return to their homes and enjoy their pensions." In whatever way this question is settled the need for providing medical men who have experience in physical treatment remains unaffected, for it will be essential to the success of the local centres for the treatment and training of disabled men that they shall be administered by medical experts. There are certain centres in this country where this experience can be gained, but it would seem to be necessary to organize the system so that medical men disposed to take the matter up should at once have facilities for gaining the necessary experience.

MR. ROCKEFELLER AND MEDICAL RESEARCH.

MR. ROCKEFELLER is to be congratulated on the fine spirit of philanthropy which has made him recognize the duties of great wealth, and even more on the enlightenment which has guided him in the selection of methods of using it for the increase of the happiness of his fellow men and the welfare of the world. How varied and large-minded are his schemes for the promotion of those objects can be gathered from a pamphlet entitled *The Philanthropic Boards established by John D. Rockefeller*, recently issued. The most important among them is the Institute for Medical Research, the object of which is the prevention and treatment of disease. Founded in 1901, it now consists of laboratories where investigations are made in pathology, bacteriology, chemistry, physiology, experimental surgery, and experimental biology; a hospital with accessory laboratories, where clinical studies are carried on; and a department of animal pathology which has been established on a farm near Princeton, New Jersey. Dr. Simon Flexner is is the Director of the Laboratories, and the Board of Scientific Directors consists of Drs. William H. Welch, Theobald Smith, Theodore C. Janeway, Simon Flexner, Hermann M. Biggs, T. Mitchell Prudden, and L. Emmett Holt. The Institute has published twenty-three volumes of *Studies*, and several monographs. It also publishes the *Journal of Experimental Medicine*, of which twenty-four volumes have appeared, and the *Journal of Biological Chemistry*. The object of the Rockefeller Foundation, which obtained its charter in 1913, is "to promote the well-being of mankind throughout the world." The first direction in which it showed its activity was the establishment of an International Health Board. Another was the appointment of a Commission to study the needs of medical education and public health in China; this led to the establishment of a China Medical Board. A part of the annual income is being applied in helping outside organizations not connected with the Foundation, but engaged on work that comes within its corporate purposes. Among these are the American Association for the Conservation of Vision; and a National Committee for Mental Hygiene, which has contributed to the cost of conducting surveys for the care and treatment of the insane in certain States, and similar purposes. The Foundation has also given large sums toward the establishment and maintenance of a school of hygiene and public health at Johns Hopkins University, and toward the control of the epidemic of anterior poliomyelitis and the after-care of cases of that disease. The purpose of the International Health Board is the promotion of health throughout the world by research and the treatment or prevention of disease. Among the lines of work undertaken by the Board are the control of uncinariasis, malaria, and yellow fever. A commission for the study of that disease in its endemic centres in South and Central America started on June 17th, 1916; it returned recently to the United States, and Major-General W. C. Gorgas, who was at its head, has stated that it had been very successful, and that details of its investigations and recommendations would be published. The purpose of the China Medical Board is to promote the development of scientific medicine and hygiene in China through medical schools, hospitals, training schools for nurses, and so forth. It is proposed to establish medical schools at Peking and at Shanghai. Among the other foundations are a General Education Board and a Bureau of Social Hygiene. In the work of the Education Board is included the promotion of medical education. In pursuance of this object the Board has helped to place the teaching of medicine, surgery, and pediatrics on a full time university basis by making gifts and pledges amounting in the aggregate to about £584,175 to Johns Hopkins University, Baltimore, Washington University of St. Louis, and Yale University. The Bureau of Social Hygiene was founded for "the study, amelioration, and prevention of those social conditions, crimes, and diseases which adversely affect the well-being of society, with special reference to prostitution and the evils associated therewith." It is announced that Mr. John D. Rockefeller, jun., who has been president of the Foundation since its establishment, has resigned that position as from May 15th, 1917, when he will become chairman of the board of trustees. The reason given for his retirement is that the work of the Foundation has expanded to such an extent that it is necessary for one person to give his whole time to its direction. Mr. Rockefeller will be succeeded by George Edgar Vincent, Ph.D., LL.D., president of the University of Minnesota, and formerly dean of the faculty of arts, literature, and science of the University of Chicago. There will be no change in the policy of the Foundation.

THE PRICE OF SKILL.

IT would be going outside our proper sphere to attempt to make an *ex cathedra* pronouncement on the vexed question of the fees paid to the physician and the surgeon respectively for the application of their knowledge to the

cure or relief of disease. The recent debate in our columns showed that there is wide diversity of opinion in the profession on the subject. Something, however, may perhaps not inappropriately be said on the side which chiefly presents itself to the public mind. That the doctor who seemed an angel in the hour of sickness has a very different aspect when the time for payment comes is a familiar truth which has been embodied in a well-known epigram. People grumble at the fees asked for operations which have snatched them from the jaws of death, and hint that the surgeon earns his money very easily. What has been done may often appear simple enough, but people fail to take into account the time and diligence the surgeon has spent in acquiring the skill and experience that make his task easy to his practised hand though never free from anxiety. Hippocrates truly said that art is long. The time occupied in doing an operation is no measure of the value of the service rendered. When Whistler in his action against Ruskin was sneeringly asked by counsel how long it had taken him to paint a picture which to the untrained eye doubtless seemed a hasty sketch in colours, his answer was "Twenty-five years." In Grant Duff's *Notes from a Diary* (1896 to January 23rd, 1901) he records that he asked the Bishop of Ripon whether he had not very exceptional facility in extempore speaking. The bishop said, and with justice, that real extempore speaking is very rare; in nine cases out of ten what appears to be extempore has been prepared long before, and laid up unconsciously in the recollection. He went on to cite an answer made about a sermon which had struck one of the listeners very much. "I wonder how long it took to prepare that sermon?" The answer was, "Fifty years." Scott, who little more than a hundred years ago began that series of novels which made him known everywhere as the "Wizard of the North," was well on in middle life when *Waverley* appeared. He continued to write for years as fast as his pen could go with scarcely a blot. But it must be remembered that he had undesignedly been preparing himself almost for the whole of his life; his subject matter had been incubating within him from the age of seven to that of forty-three. It may be that, as Carlyle says, he wrote too fast and too "happily," by which we suppose the Sage meant easily. The point we are concerned with here is that the value of his writing must not be measured by the rapidity of its production. All this applies with the same force to the physician as to the surgeon. Thoughtless people often grumble at the two or three guineas paid for a few words of advice. They do not reflect how long it has taken the physician to acquire the knowledge that enables him to give profitable counsel, or that the advice, if faithfully followed, may mean prolongation of life and increased efficiency in work, to say nothing of greater happiness for the patient himself and his family. The public has still to be educated to a right appreciation of the intellectual value of things and to deliverance from the superstition of a crude commercialism as the ruling principle of life.

THE FUTURE OF THE PROFESSION.

Two documents are published in the SUPPLEMENT for this week to which we would invite the attention of every individual medical practitioner, whether concerned in insurance work or not, for they raise matters of great general interest and importance. The first is addressed to the Branches and Divisions of the British Medical Association and Local Medical and Panel Committees in the United Kingdom. It points out that had it not been for the war the profession would no doubt have had to face last year an inquiry into the whole insurance system; the opinion is expressed that presently a Royal Commission will be appointed or a parliamentary inquiry instituted, and it is urged that the medical profession must be prepared with a constructive policy for the future as well as with criticisms of the present system. While recognizing that the time and energies of the profession are absorbed in other matters, it is urged that it is essential that a beginning should be made in collecting the opinions of the profession in regard to this important question, and to this end a series of questions are appended to the circular letter to which specific replies are requested before May 31st. The hope is expressed that all possible steps will be taken to ascertain the opinions of medical men on military service, for their interests must be seriously affected by future changes in the insurance system. The second document is a letter addressed to the Chairman of the Joint Committee of Insurance Commissioners by the Insurance Acts Committee of the Association with reference to certain proposals for legislation in respect to maternity and child welfare which have been published in the press. It is said that legislation is to be proposed by the Local Government Board for treatment, including domiciliary attendance, of pregnant women, nursing mothers, and young children. The absence of any evidence that a comprehensive survey of the problem has been undertaken is noted, and the opinion expressed that piecemeal handling of it is greatly to be deprecated.

MOBILIZATION OF THE PROFESSION.

IN the SUPPLEMENT for last week we published the greater part of a memorandum drawn up by the Manchester Medical War Committee. We omitted to state that the memorandum was drawn up for the purpose of conveying information to the Director-General of National Service. We are told that the manner of publication has conveyed the impression that the document had been compiled for the information and use of the Central Medical War Committee. It was not intended to convey this impression, which we hasten to correct. A copy was sent to the Central Medical War Committee by the Manchester Committee as an act of courtesy. This courtesy was appreciated. We took the opportunity last week of pointing out the value of the information contained in the memorandum.

THE exhibition of war specimens at the Royal College of Surgeons of England, Lincoln's Inn Fields, is open daily from 10 a.m. till 5 p.m., except on Saturdays, when it closes at 1.

THE Hunterian Oration before the Royal College of Surgeons of England, to be delivered by Surgeon-General Sir G. H. Makins K.C.M.G., on February 14th, will deal with the influence exerted by the military experience of John Hunter on himself and on the military surgeon of to-day.

IN a review of a report on miners' phthisis in South Africa, published on page 653 of the BRITISH MEDICAL JOURNAL of November 11th last, an account of the clinical and pathological features of silicosis of the lungs was given. The exact nature of the doubly-refracting particles seen in microscopic sections of silicotic lungs is discussed in a recent report (*African Institute for Medical Research*, 1916; sup. roy. 8vo, pp. 24, 19 figures, 5s.) by Drs. Watkins-Pitchford and Moir of the South African Institute for Medical Research. These authors find that a vast majority of the mineral particles accumulating in the Rand miners' lungs are of quartz in the form of roundish or three-sided thin scales, most of them less than 2 μ in length; the longest particles measured 14 μ, and for every fragment 8 μ long or more there were 2,000 smaller particles. Only 1 particle in 400 was found to be some mineral other than quartz, and composed of the more highly refractile minerals, sericite (a potash mica), rutile, zircon, tourmaline, or chlorite. No evidence of any physiological selection of these various minerals by the lungs was found; their selection seemed to be determined solely by the size of their particles. The amount of extraneous mineral matter present in silicotic lungs is much greater than that in the normal lungs of elderly South Africans who are not miners; the maximum amount was found in cases in which the disease was in its earlier stages, and before extensive disorganization of the pulmonary tissue by fibrotic consolidation had occurred.

THE WAR.

THE CHANGING OF DRESSINGS.

PROFESSOR VULPIUS has been speaking very plainly to some of his surgical colleagues. He says that they have not shown in practice a rational conception of the indications for and against the changing of dressings. It might, he said, have been supposed that common sense and an elementary knowledge of surgery would have been sufficient, but experience showed that sins of omission and commission were exceedingly numerous. Severely suppurating compound fractures were encased in unfenestrated plaster-of Paris splints, while the dressings of recent, uncomplicated shell wounds were changed more than once a day. These extremes could still[1] be found, he said, in several military hospitals. The worst offenders were not so often the medical men who had become surgeons in the course of the war as the surgeons of some standing. It did not so much matter that superfluous changes of dressings wasted material and the time of surgeons and nurses, as that they were injurious. Every change of dressings, even when necessary, implied movement, active and passive, the opening of lymph channels, haemorrhage, possibilities of infection, and a host of other dangers. He considered that the indications and contraindications for changing dressings should be systematized and standardized. He summarized his views as follows:

1. The most important indications for a change of dressings were haemorrhage, phlegmon, abscess, erysipelas, and gangrene. But the symptoms must be definite. Pain, a sense of heat and tension about the wound, fever, an abnormal pulse, and the condition of the tongue and senses should all be noted, as well as the patient's general appearance. In the absence of any of these symptoms it was unjustifiable to suspect complications and to change the dressings. Simple and obvious as this advice was, he had found it ignored in practice thousands of times, unnecessary, and therefore harmful, changes of dressings being undertaken.

2. It was obvious that, in the presence of complications, dressings should be regularly changed, several times a day if necessary.

3. Change of dressings was undoubtedly indicated when they no longer fulfilled their function of keeping the wound clean by absorbing the discharge. But the question was when this stage was reached. It was most common to find dressings being changed as soon as a trace of discharge appeared on their surface. Yet this merely showed that they were acting properly, and keeping the wound dry, and it was sufficient to apply more cotton-wool and bandages outside the original dressings, and thus to keep the bedding clean, to prevent flies settling on the discharge, and to maintain the drainage of the wound; always provided the condition was in other respects satisfactory. A properly drained and normally healing wound required change of dressings only when it itched, burned, or felt wet under the dressings. The most important objective indications for a change of dressing were a rise of temperature, a badly smelling dressing, extensive flooding of the dressing with discharge, and its escape between the dressings and the skin. It was clear that the amount and nature of the discharge on the one hand, and the amount and nature of the dressings on the other, were the factors to determine the frequency with which they should be changed. There should be no hard and fast rule as to the time for which dressings should remain unchanged; the one fundamental rule was to change them as seldom as possible. An exception to this rule was, however, to be made with fenestrated, rigid dressings; frequent changes were needed to prevent the discharge escaping between the dressing and the skin, causing troublesome itching.

4. The final indication for a change of dressings was the impending transport of the wounded. They should be sent away with clean dressings.

Professor Vulpius also expressed the opinion that great lack of discrimination was shown in the choice of dressings. Iodoform gauze was much used and misused. The presence of iodoform in the gauze could not check a serious infection; iodoform in a normally discharging and healing wound was useless. Undoubtedly the use of expensive iodoform gauze could be reduced to a minimum without the slightest disadvantage to the wounded; in fact, it should be used only when no other sterile dressing was available. For use as tampons in wounds strips of sterile gauze were good enough, particularly when the recent wound had already been painted with tincture of iodine. Gauze bandages were also wastefully used. Wood fibre was an excellent absorbent, which could be sterilized easily and applied to the wound over a layer or two of gauze, which kept the fibre from immediate contact with the wounded tissues. Professor Vulpius concluded with an appeal for the preservation, washing, and sterilization of old dressings for later use. The practice of cutting up and discarding dressings stained with discharge was wasteful.

[1] *Deut. med. Woch.*, Sept. 28th, 1916

CASUALTIES IN THE MEDICAL SERVICES.

ARMY.

Wounded.

Captain W. C. Forster, R.A.M.C. (temporary).
Captain W. D. Reid, R.A.M.C. (temporary).
Captain F. B. Simpson, R.A.M.C. (temporary).

DEATHS AMONG SONS OF MEDICAL MEN.

Archibald, William Nicol, Private Royal Fusiliers, elder son of Major W. N. Archibald, R.A.M.C., Netley Abbey, Hants, killed in November, 1916, aged 25.

Dalziel, Charles Sutherland, Second Lieutenant, youngest son of Dr. Dalziel, of South Shields. He was educated at South Shields High School, got a commission in September, 1915, and had been at the front for a year. He had three brothers also serving.

NOTES.

MILITARY MEDAL.

THE King has conferred the Military Medal for bravery in the field upon two members of the Queen Alexandra Imperial Military Nursing Service Reserve, one member of the Territorial Force Nursing Service, and a number of non-commissioned officers and men of the R.A.M.C. and the colonial medical services.

CONFERENCE ON THE TRAINING OF DISABLED MEN.

On the initiative of the Belgian Government, with the concurrence of the French Government, an inter-ally conference for the study of the professional re-education of the wounded and questions affecting the interests of war invalids will be held in Paris on March 6th. The work of the conference will be distributed among five sections: Physical re-education; professional re-education; the placing and establishment of disabled men; their economic and social interests, and a special section dealing with the blind and the deaf. Communications should be addressed to the General Secretary of the Conference, 1, rue du Bocage de Bléville, Le Havre, or to the Secrétariat de l'Office National des Mutilés et Réformés de la Guerre, 97, quai d'Orsay, Paris (VII^{e}).

THE ITALIAN MEDICAL SERVICE.

According to a list, admittedly incomplete, published in the *Policlinico* of January 1st, the number of medical officers of the Italian army who have died at the front is 86. To these must be added 5 who have perished in torpedoed ships and 10 who have died of disease contracted in the service. Three have died in Lybia. The losses among medical students on active service amount to 93.

RECOGNITION OF WORK OF MEDICAL PRISONERS.

The Austrian Minister of War has issued an order of the day in which special mention is made of the work of Drs. Savina and Paroldi, medical officers of the Italian army, in the concentration camp at Manthausen, where they are themselves interned as prisoners of war. It is stated that the Italian officers gave their professional services to sick and wounded Austro-Hungarians as devotedly as to their own countrymen. The General Commandant of the camp is ordered to convey to Drs. Savina and Paroldi the congratulations of the Austrian military authorities.

LEAD POISONING FROM BULLETS.

Dieselhorst[1] asserts that lead poisoning from retention of bullets in the body is more common than is generally realized. Symptoms of plumbism, he says, may not develop until years after, even when the fragments of bullet are encapsuled in fibrous tissue. He considers that the danger of plumbism from retention of bullets in the body is a factor seriously to be considered when expectant treatment or removal of the bullet is under discussion. Schmieden[2] also holds that retained bullets may provoke serious plumbism, but while a few suffer, hundreds do not, and he considers that only when a bullet is superficial and easily removed should the prospect of plumbism be taken as an indication for operation.

[1] *Muench. med. Woch.*, September 26th, 1916. [2] Ibid.

QUACK TREATMENT OF VENEREAL DISEASES.

DEPUTATION TO THE LOCAL GOVERNMENT BOARD.

THE President of the Local Government Board (Lord Rhondda) on January 24th received a joint deputation from the Royal College of Physicians of London, the British Medical Association, the National Council for Combating Venereal Diseases, and the Association of Municipal Corporations.

The deputation asked that legislation be introduced for the elimination of quack methods in the treatment of venereal diseases.

Sir HAMAR GREENWOOD, M.P., Vice-President of the Association of Municipal Corporations, who introduced the deputation, said that a resolution on the subject had been adopted by that body.

Dr. FREDERICK TAYLOR (President of the Royal College of Physicians) said that the College had passed a resolution identical with that of the Association of Municipal Corporations. These diseases, he added, ought to be treated by those who knew how to do so. Members of the medical profession had to go through a course of training of from five to seven years, and had to be admitted to the *Medical Register* before they could claim to deal with any branch of medical treatment, yet unqualified persons, without training or without any guarantee that they were acquainted with disease, were permitted to treat it. The medical profession had promoted every measure of sanitary reform which meant the abolition of diseases, in spite of strenuous opposition from many quarters. Persons suffering from other infectious diseases were placed under proper control during treatment. Patients suffering from scarlet fever or typhus, for example, were isolated. In the case of these diseases the patients were incapacitated from work. Those suffering from venereal disease were not necessarily incapacitated; they could escape recognition for weeks or months, and might remain untreated. He emphasized the point that the treatment ought to be conducted by scientific and skilled methods, and therefore by qualified persons

Mr. E. B. TURNER (Chairman of Representative Meetings of the British Medical Association) said that the Association had passed strong resolutions on the subject. It felt that it was extremely important, first, that advertisements of the form of quackery in question should be stopped. A person affected with venereal disease was not only dangerous to himself and to the community, but also in many cases to posterity. The medical profession, in seeking to bring about efficient means of treating these diseases in the early stages, was working for the good of the community. He mentioned that point because he had had it thrown in his teeth that the profession was working for its own interests.

Sir MALCOLM MORRIS expressed the hope that Lord Rhondda would introduce a bill to suppress the quack treatment of venereal diseases.

The LORD MAYOR OF BIRMINGHAM and Mr. J. W. WILLIS BUND also spoke.

Lord RHONDDA, in reply, said his department fully realized the burning nature of the question of treating venereal diseases, and he had been impressed with the necessity of dealing with it as a war measure. It affected not only the health of the population to-day but the health of future generations. Of all the matters that came before the Local Government Board he could sincerely say that he looked upon the treatment of these diseases as one of the most important, and he would go further and say that it was the most urgent question with which his department had to deal. He was not in a position to commit himself to anything definite, but he thought he could give the assurance that legislation would be procured at a very early date. In reply to a vote of thanks, he added that so far as he was concerned the deputation might dismiss from their minds any suggestion there might be that the medical profession were actuated by selfish motives in their hostility to quack methods.

THE authorities of Yale have decided to establish a university board of health to take charge of the medical examination of all students, the supervision of those taking part in athletics, and the inspection of dormitories, lecture rooms, and assembly halls.

THE ROYAL BRITISH COLLEGE OF NURSING.

AMALGAMATION WITH THE ROYAL BRITISH NURSES' ASSOCIATION.

A SPECIAL general meeting of the Royal British Nurses' Association was held at the house of the Royal Society of Medicine on January 18th to consider the proposed amalgamation of the College of Nursing with the Association. Dr. Bezly Thorne, who presided, read a letter from the President, Princess Christian of Schleswig-Holstein, expressing regret at her inability to be present, and stating that she was satisfied that the fusion of the work of the two bodies would be a great advantage to the nursing profession and to the public generally. Dr. Thorne said that the proposed amalgamation had been considered in all its phases by the council, which had come to the conclusion that it would enhance the dignity and increase the efficiency of the nursing profession and be to the great advantage of the public. Mr. Herbert J. Paterson, honorary medical secretary, in moving a resolution approving the agreement, said that the scheme for the foundation of a college of nursing suggested by the Hon. Arthur Stanley last year, was at first regarded with some suspicion by the council, but it had been remodelled and the points to which exception could be taken removed. For instance, the objection that there was too large a lay representation on the council no longer held good, for of the thirty-nine members of the proposed council only two were lay. The council would in the future be elected by the members and would be democratic in every sense. An important safeguard added to the original scheme was that before any person could be removed from the proposed register she would have the right to appear before the council in person or employ an agent, and any motion to erase a name would have to be passed by a two-thirds majority of those present and voting. The Royal British Nurses' Association had always stood for an adequate curriculum and for State registration, and the College of Nursing advocated a uniform curriculum, a one-portal examination, and State registration. One gratifying result of the proposal was that the opposition to State registration on the part of the majority of the managers of the large training schools had been removed, so that in future Parliament would not be able to plead that opposition as a pretext for ignoring the just demands of the nursing profession for State registration. The motion was seconded by Miss Latter, late matron of the Chelsea Infirmary, and supported by Sir James Crichton-Browne, one of the vice-chairmen of the Royal British Nurses' Association, who said that the amalgamation would result in State registration, which would distinguish the trained from the untrained. Registration was more than ever necessary, because the war had drawn into nursing work numerous amateurs, who had no doubt done excellent work under skilled guidance, but it was to be feared that after the war many would continue to pose as nurses, and would compete with trained nurses. The proposed amalgamation was also supported by Professor Glaister (Glasgow), Dr. Comyns Berkeley, Dr. Curry, and Miss Wortabet. The only discordant note sounded at the meeting came from Miss Beatty, who opposed the amalgamation. In reply to a question by Dr. Griffith as to the functions of the new council with regard to the education and registration of nurses, the Chairman said that the council would never aspire to interfere with the regulations of the Central Midwives Board.

The motion, on being put to the meeting, was carried *nem. con.* Votes of thanks were accorded to the Chairman, the secretary, Miss Macdonald, and Mr. Paterson. Dr. Bezly Thorne, in acknowledging, referred to the great services rendered by Dr. Comyns Berkeley in the course of the negotiations for the proposed amalgamation.

The first council proposed to be established under the amended or supplemental charter will consist of thirty-nine members, comprising ten members of the medical profession (including one woman), two lay members (the Hon Arthur Stanley, M.P., and Mr. William Mineti), sixteen past and present matrons, four lady superintendents, one sister-in-charge, one sister (late), and five trained nurses, including private and district nurses.

This first council is to hold office until the expiration of two years from the date of the charter, or until the first appointment of the council under the by-laws, which direct that the members of the council shall be elected by the members of the

corporation, and that the council shall be representative of the medical profession, matrons and principal officers of hospitals and infirmaries, superintendents of nursing, trained nurses, managers of hospitals and infirmaries, and persons and bodies interested in the question of nursing.

The council is to appoint a Consultative Board consisting of persons having the same qualifications as the council enumerated above, and also an Examination Board consisting of persons experienced in lecturing, or teaching in nursing schools, or physicians or surgeons on the staffs of hospitals to which nursing schools are attached. The council may establish branches or local boards either in the United Kingdom or elsewhere, and is to keep a register of such persons as shall in its judgement be fit and proper persons to act as nurses, and entitled to a certificate of proficiency granted in accordance with the regulations for the time being prescribed by the council. The register of the Royal British Nurses' Association and of the College of Nursing will form the first register, but a fee of one guinea will be payable on the subsequent entry of a name on the register. Any person whose name is removed from the register will cease to be a member of the corporation, and the council may remove the name of any person it deems unworthy to remain a member after an inquiry and the adoption of a resolution passed by a majority of at least two-thirds of the members present and voting; the quorum for this purpose is to be at least twelve. Diplomas will be granted to all members holding diplomas of the Royal British Nurses' Association, and the council may issue diplomas of fellowships to members who pass such higher examinations as may be prescribed.

LEEDS.

A meeting was held in Leeds on January 19th to consider the proposal for a college of nursing. Mr. Charles Lupton, chairman of the Leeds Infirmary, presided, and among the speakers was the Hon. Arthur Stanley, who said that he hoped that, if the Privy Council approved he granting of the charter to the proposed Royal British College of Nursing, it would take its stand in a humble way with the Royal Colleges of Physicians and of Surgeons. He considered that it ought to be endowed, and he hoped that two great organizations which had collected large sums for the Red Cross would succeed in raising a sufficient sum of money. The nursing profession was practically solid for State registration, but there would be some difficulties about a registered uniform. In the Red Cross, during the last two years, there had been probably more changes in uniform than in the British army during the last fifty years. While he could not say whether a registered uniform would be a good thing he was certain that a properly protected badge would be beneficial.

Miss S. A. Swift, Matron-in-Chief, Joint War Committee, said that for a period of grace, the first two years, the College would accept for registration nurses who had had a two years' training, later three years' training would be required; work in V.A.D. hospitals, which were special hospitals, would not count. She added that there would be a supplementary register of nurses who had devoted themselves to work amongst children.

Sir Berkeley Moynihan, in proposing a vote of thanks to Mr. Stanley, said that when the scheme was first heard of it was viewed with some anxiety. The medical profession knew that the international standard of British nurses placed them at the head of their profession all over the world, and it had at first felt some apprehension lest something might be done insidiously to lower the standard of training of nurses in this country. It was satisfactory, therefore, to know that the minimum period proposed was three years. Nurses must necessarily be of different grades, and he suggested that those with the highest qualifications and endowments might be recognized as Fellows.

Lieutenant-Colonel H. Littlewood, Commandant of the 2nd Northern Territorial Hospital, seconded the vote of thanks, which was heartily accorded.

CENTRAL COMMITTEE FOR THE STATE REGISTRATION OF NURSES.

The Central Committee for the State Registration of Nurses, on which the British Medical Association and the Royal British Nurses' Association are represented, at its meeting on October 21st, 1916, decided by a large majority to proceed with its own bill, subject to certain amendments, and reaffirmed its fundamental principles, which were that there should be a statutory general nursing council to regulate the qualifications of trained nurses and provide for their registration, and that the nursing profession should be directly represented on the council. It also provided that after a three years' term of grace a nurse must have had not less than three years' training under a definite curriculum prescribed by the council, in an approved hospital, and must have passed an examination approved by the council. It remains to be seen what action the Central Committee will take, in view of the decision of the Royal British Nurses' Association to amalgamate with the College of Nursing.

Ireland.

THE Registrar-General's return of emigration from Ireland shows an increase of 1,467 in the number of women, and a decrease of 4,824 in the number of men. The total was 7,302 (1,743 males and 5,559 females) in 1916, compared with 10,659 (6,567 males and 4,092 females) in 1915. There were 416 fewer emigrants from Connaught; 494 fewer from Munster; 1,057 fewer from Ulster; and 1,390 fewer from Leinster.

HONOUR FOR SIR WILLIAM WHITLA, M.D.

The many friends of Sir William Whitla, both lay and professional, saw with much pleasure, as was briefly announced in this column last week, that His Majesty had been graciously pleased to appoint him one of his Honorary Physicians in Ireland, in the room of the late Dr. James Little of Dublin. Sir William took the degree of M.D. in the old Queen's University in Ireland with the highest honours, and has occupied the chair of materia medica in the Queen's College, and, since its origin, in the Queen's University of Belfast. He is Senior Physician in the Royal Victoria Hospital. Some years ago he built the Medical Institute in Belfast and presented it to seven trustees for the use of medical bodies in the North of Ireland. He was also President of the British Medical Association the year of its visit to Belfast in 1909. Every one will join in offering Sir William their warm congratulations, and in hoping that he and Lady Whitla may be long spared to enjoy their numerous honours and distinctions.

ROYAL ACADEMY OF MEDICINE.

The president of the Royal Academy of Medicine in Ireland, Dr. R. Dancer Purefoy, entertained the Lord Lieutenant to dinner at the Royal College of Surgeons on January 18th. Dr. Purefoy thanked the Lord Lieutenant on his own behalf, and that of the Academy of Medicine, for his presence, which was evidence of the interest he took in the social and professional life of the city. In all that concerned the conditions of life in Dublin and in Ireland the Lord Lieutenant was an observant spectator, and in all its intellectual, industrial, and sometimes political activities, he was a close, intelligent, and sympathetic observer. In acknowledging the toast of his health, the Lord Lieutenant spoke at some length in favour of the scheme of the Department of Agriculture for increasing the production of food in Ireland. Among those present at the dinner were the Archbishop of Dublin, the Provost of Trinity College, and the presidents of the Royal Colleges of Physicians and Surgeons.

NATIONAL COUNCIL FOR COMBATING VENEREAL DISEASE.

At a public meeting, summoned by the Lord Mayor of Belfast, on January 18th, it was resolved to establish a branch of the National Council for Combating Venereal Diseases.

Professor Lindsay, who moved a resolution to this effect, pointed out how the innocent often suffered, and that recent exact methods of examination showed that 10 per cent. of their urban population suffered from syphilis; Sir William Osler said it came third or fourth in the list of all killing diseases. He gave a brief history of modern opinion and action, and quoted statistics and the recommendations of the Royal Commission. The Lord Bishop of Down seconded the resolution, which was supported by Sir John Byers, who pointed out the difference between this disease and ordinary infections; it crippled innocent adults and children in their mental and physical condition, was a vital factor in maternal and child welfare, caused blindness and deafness, idiocy and imbecility, and some forms of insanity; its economic aspect was serious, involving a loss to the nation and inefficiency in the army. Although the Commission hesitated as regards notification, he thought such hesitation rather stunted the value of its report, and impaired its thoroughgoing efficiency. Local authorities should now take a stand in the question. Captain W. J. Wilson, specialist sanitary officer in the Northern Irish Command, and lecturer in hygiene in Queen's University, also supported the proposal. A general committee was appointed, and also an executive committee. Mr. Robert Campbell, F.R.C.S.Eng., President

of the Ulster Medical Society, proposed, and Mr. A. B. Mitchell, F.R.C.S.I., President of the Ulster Branch of the British Medical Association, seconded, a hearty vote of thanks to the Lord Mayor.

SWAN MEMORIAL FUND.

A committee has been formed in Dublin to raise subscriptions to found a memorial to the late Mr. Robert Lafayette Swan, Fellow and ex-president of the Royal College of Surgeons in Ireland, and surgeon to Dr. Steevens's and the Orthopaedic Hospitals. Mr. Swan first became connected with the former hospital fifty-seven years ago, and it was in 1876 that he was mainly instrumental in founding the Incorporated Orthopaedic Hospital in Ireland. It is not possible at present to state what form the memorial will take, but it is hoped it will not only be worthy of the man but such as he would himself have liked. Subscriptions to the amount of £75 6s. 6d. have already been received; further subscriptions may be sent to the honorary secretary and treasurer, Dr. T. Percy C. Kirkpatrick, 11, Fitzwilliam Place, Dublin.

ULSTER MEDICAL SOCIETY.

The second meeting of the session was held in the Medical Institute on January 11th, when Mr. Robert Campbell, F.R.C.S.Eng., President, was in the chair. A report of Council on the joint meeting with the Ulster Branch of the British Medical Association in regard to the formation of a branch of the National Council for Combating Venereal Disease was approved. Sir Alex. Dempsey showed a fibroid uterus which he had successfully removed from a woman five months pregnant; she could never have delivered herself, owing to the pressure on urethra and bowel and general blocking of the pelvis; the abdomen was distended by it; there would have been danger in Caesarean section. Mr. Hicks showed a similar specimen, also removed successfully, obviating extreme haemorrhage, which his patient had suffered from before. Dr. J. C. Rankin showed some *x* ray photographs of intracapsular fracture. This gave rise to an interesting general discussion on the etiology, course, and nature of intracapsular and extracapsular fractures, in which the President, Drs. Kevin, Irwin, Dorman, Calwell, Burns, and Murphy joined. Mr. Hicks read a paper on the use and abuse of the pessary, and illustrated it with numerous diagrams and anatomical details on the blackboard. Mr. R. J. Johnstone and Dr. Lowry spoke.

AMBULANCE WORKERS' AWARDS.

Last week about 100 persons were presented with medals and certificates of honour, awarded by the Order of St. John, for services rendered in the cause of humanity during Easter week, 1916. The presentations were made by Sir Henry Blake, K.C.M.G. Some of those to whom medals had been awarded are now away at the war, one of them in Rumania. Mr. Justice Ross, P.C., who presided, said that they were very well aware of the state of facts that led to that ceremony. A lamentable rebellion broke out in the country, and Dublin was the seat of the principal disorder, which resulted in regrettable loss of life and damage to the great public buildings of the city. The casualties among the troops alone were considerably over 500, and amongst the civil population far exceeded 1,000. This most unfortunate state of affairs gave an opportunity to the St. John Ambulance Brigade to help at a time when the streets were swept by machine gun and rifle fire. The members of the brigade were mobilized immediately, and at once went out to posts of danger, and rendered most memorable service. Those connected with the British Red Cross Society rendered equally valuable service, while a great number of others, some attached to hospitals and some unattached, came out in a most spirited manner and rendered all the assistance in their power. The principle of the St. John organizations was the old one of the Knights Hospitallers, to go to the help of the stricken at whatever the risk. The way in which the nurses behaved was beyond praise. Sir Henry Blake said that though a rebuilt and resuscitated Dublin might bring oblivion of some memories, nothing could wipe out the heroic record of the men and women of Dublin who in that terrible week devoted themselves to their work with the energy and fearlessness which entitled them to take their stand side by side with those who had been engaged in the highest works of mercy.

NEED FOR MEDICAL MEN IN PARLIAMENT.

At its meeting on last Wednesday in Dublin the Council of the Irish Medical Association adopted the following resolution:

> That the Council of the Irish Medical Association is of opinion that for the successful solution of the many problems of public health which are certain shortly to come before Parliament, as well as for the safeguarding of the interests of the medical profession in any changes that may be made in its relation to the public, it is of the first importance that there should be an increased number of well-informed and able medical men in Parliament.

Correspondence.

THE PROPHYLAXIS OF VENEREAL DISEASES.

SIR,—The critical and helpful articles that were published in the *Lancet* and the BRITISH MEDICAL JOURNAL on January 13th have led me to ask for space in your columns for a few remarks on this subject, which, essentially medical though it is, is of high concern to the whole community. Since the appearance of my letter in the *Times* of January 6th I have had numerous communications from various quarters indicating such concern as well as a widespread conviction that medical men should make known to their patients generally those means of prophylaxis against venereal infections with which pathological science has in recent years supplied them. Up to now, however, although the public have been very generally and rightly instructed of late with respect to the multiform and dangerous results of syphilis and gonorrhoea, and also to the necessity of prompt treatment after these diseases have been contracted, a general silence has prevailed on the matter of prevention, not only on the part of the many lay members of the community who have earnestly and successfully promoted the important measures which have now found accomplishment, but also of the medical profession at large, inclusive of that special section of it which is devoted to the guardianship of the public health. The reason of this public attitude on the part of the medical profession generally (I am not forgetting the many individual medical men who are in no wise reluctant to aid in checking the spread of these infections by imparting their knowledge as freely as possible) is not far to seek. Medical men are hampered in this action by the "mediaeval doctrine," which, though it may not be expressed in words, is still operative in leading the public to regard sexual diseases from a different standpoint from that which they maintain towards all others. While the more prominent and powerful lay promoters of the recent great advance made in informing the public of the dangers of venereal diseases decline to take notice of the paramount importance of preventing infection at its source, it is, perhaps, scarcely to be wondered at that the medical profession as a body has not entered into an undertaking which, without some encouragement, would at least be difficult, and liable to miss a rapid success.

It is undeniably true that neither moral nor religious instructions will succeed in the future any more than they have succeeded in long past centuries in checking to any considerable extent the gratification of sexual instinct in both sexes by "irregular intercourse."

The danger of venereal infection has been long held out as a physical deterrent, but with little or no effect, and no adequate result in this direction can be expected from the more detailed accounts of these dangers that have lately been given to the public. However great the danger, the fact remains that only a comparatively small proportion of either sex, with the exclusion of regular prostitutes, contract syphilis or, indeed, gonorrhoea; and thus the risk is constantly taken, even by those who are well aware of what consequences are entailed by failure to escape infection.

In a private letter to me Sir James Crichton-Browne, who has granted my request to be permitted to use it as I like, says:

> If syphilis were an inevitable *ordained* consequence of irregular sexual intercourse something may be said for leaving it alone; but as it is only a very occasional consequent it can be but feebly deterrent, if deterrent at all, and ought to be unhesitatingly prevented in every possible way. The prevention of syphilis, and the prevention of immorality should be kept wholly distinct from each other.

The Government have interdicted the sale of whisky less than three years old, the object being that in maturing it may be freed from the ingredients that produce injurious effects on the consumer. But, according to the opponents of the prevention of syphilis, that must be all wrong. The rawer the whisky, the more fusel oil in it, the better; so that men may be prevented from drinking by the dread of delirium tremens. I remember Lord Houghton telling me that at the time of the discussion on the Contagious Diseases Act he had some conversation with Mrs. Butler. At last he said to her: "It seems to me that you regard the syphilitic virus as a beneficial moral agent. Now, tell me, if you had that virus locked up in a box and you had the key, would you keep it locked up or would you let it loose upon humanity?" Mrs. Butler vouchsafed no answer.

I wholly agree with the criticism in the BRITISH MEDICAL JOURNAL that effective measures of prevention must have regard to both sexes, "it being at least as likely that one infected woman will infect many men, as that one infected man will infect many women." This fact is persistently ignored in much that has lately been spoken and written on this subject. The dissemination of the disease by the male has especially attracted attention now owing to the assumption, based, I assume, on some ascertained facts, that large numbers of infected soldiers will return to this country during and after the war. It is on this assumption, at least, that a special plea of urgency for prompt and effectual treatment of the disease was put forward when financial aid from the State for this purpose was recently sought and successfully obtained.

I do not hesitate in expressing my opinion that doctors not only are justified in spreading the knowledge we now possess of effectual prophylaxis in respect to venereal disease, but also are bound in duty to do so in view of their knowledge of the results of disease, and of their functions as promoters of the public health.

Suggestions have been made to me for the forming of an association of medical men and others with human interests for promoting the knowledge of effectual prophylaxis against venereal diseases; but it seems clear that an initiative in this direction might be taken with far better prospects of quick success at the present juncture, if not by the Local Government Board itself, by the existing Society of Medical Officers of Health. The question is, and should be regarded as, exclusively medical. The time has come for plain speaking and prompt action on the part of the medical profession. In the words of the *Lancet* article, "preventive treatment is a logical step forward, and ought to be taken at once."—I am, etc.,

London, W., Jan. 21st. H. BRYAN DONKIN.

TARTAR EMETIC AND MALARIA.

SIR,—The very important article by Sir Leonard Rogers in your issue of January 6th, suggesting that intravenous injections of tartar emetic are able to kill the sexual forms of the malaria parasites, should, in my opinion, be followed up at once by careful and long-continued researches by enumerative methods for the purpose of establishing the point with certainty. The work could easily be done in this country as well as abroad, but only by full-time workers who are thoroughly acquainted with the technique and have the patience to do the arduous work required. These enumerative methods are the only ones which are likely to set the question finally at last, because the parasites vary naturally to such a large degree from day to day that it is always difficult to distinguish between accidental and therapeutic improvements.

It is, of course, well known that quinine and many other drugs do not affect crescents, as shown most exactly by enumerative methods in the researches by Dr. (now Captain) David Thomson, published in the *Annals of Tropical Medicine*, 1910–13, and carried out at my suggestion in Liverpool. If, therefore, tartar emetic does destroy them, we shall be able to add another and powerful weapon to our armoury for the prevention of malaria, since the sexual forms are the forms which are engaged in carrying the parasite into the mosquito. The importance of the proposed researches need not therefore be enlarged upon.

Sir Leonard Rogers is quite properly not at all dogmatic on his find—which promises to be one more important discovery to his already distinguished account. His opinion that the antimony does not affect the non-sexual parasites seems to be supported by an article by Colonel Jackson in the *Indian Medical Gazette* for December last. A case of kala-azar had long been under treatment with intravenous injections of tartar emetic when it developed typical mild tertian malaria, which had to be treated independently with quinine. But this point does not in any way impugn the suggestion of Rogers regarding the sexual forms.

I certainly hope that the opportunity for further researches will not be lost, and think that a special malaria ward ought to be allotted somewhere in this country for such investigations. The investigations could there be extended to the moot question of intramuscular injections of quinine in malaria, regarding which there is a wide divergence of opinion between therapeutical experimenters and some clinicians. In fact, it may almost be maintained that the large case-mortality in malaria may be greatly due to the use of such intramuscular injections, and certainly I have had many cases which were supposed to have been cured by the injections but which continued to relapse afterwards as usual. Another point requiring investigation by the enumerative method is concerned with the efficacy of other cinchona alkaloids besides quinine.—I am, etc.,

London, W., Jan. 17th. RONALD ROSS.

THE MEASURE OF THE POTENCY OF ANTISEPTICS.

SIR,—A good case has been made by Dr. Browning and his colleagues for the use of "flavine" as an antiseptic, but I think that the table of "antiseptic potencies" and "therapeutic coefficients" which they give does not apportion credit to the various antiseptics according to their utility, and therefore their conclusions are open to criticism.

Dealing first with potency, I pointed out in your issue of May 13th, 1916, that even if this were high in a mixture consisting of a small volume of pus and a large volume of the antiseptic lotion—a condition present when a wound is freely irrigated—the antiseptic would be of no value unless it acted *quickly*, that is, within a few minutes. Their experiments do not give any information on this point.

Again, when infected cells tend to be in excess and the volume of antiseptic relatively small—a condition obtaining when the antiseptic is applied in a dressing to the infected tissues—we have a completely different state of affairs. The antiseptic potencies which the table gives do not cover this case, and are very different from those which would be given by the result of their experiments with pus from an empyema. In these the conditions were analogous to those in a wound, and the authors then found that flavine was only four times more powerful than carbolic acid, a truer estimate of its potency than the 800 times which their table gives for the action in serum.

In my experiments in this connexion I judged of the potency of an antiseptic by its power to prevent obvious growth of the organisms in slightly infected pus, or in blood cells containing a few infected cocci. In these, chloramine-T 1 in 100, and, provided only a small proportion of fluid was present, mercuric chloride 1 in 1,000 to 1 in 1,250, did not prevent the growth of pyogenic organisms, whereas their table gives chloramine-T 1 in 250 and mercuric chloride 1 in 10,000, as sufficient to kill in serum. In regard to carbolic acid, I found, as one would expect, that its action was not more powerful in pus than in serum, and not, as they found, twice as effective.

Considering next the therapeutic efficiency, I concluded from my experiments that, with the strength of antiseptics generally used, mercuric and hypochlorous solutions had, compared with carbolic acid, relatively little effect on phagocytosis. This appears to be at variance with the list of therapeutic coefficients given in the table. However, the explanation of the difference is clear. In my experiment I avoided the use of excess of saline by making up the corpuscles, suspension of micro-organisms and antiseptics in serum, and also used a large proportion of corpuscles, instead of taking, as they did,

one volume of serum and one each of corpuscles, micro-organisms, and antiseptic respectively, in saline.

Reflection will, I think, show that my experiments correspond more closely to what takes place in a wound when an antiseptic has been applied in a dressing to the infected tissues and serum oozed out; and also that they demonstrate that in these circumstances mercuric and hypochlorous solutions have, compared with carbolic acid, much less effect in inhibiting phagocytosis than the table tends to show. In this connexion, I may say that I have noted activity of the leucocytes in a clot in the presence of a hypochlorous solution up to a strength which begins to disintegrate the fibrin. Also, I have collected leucocytes from a wound just washed with half strength eusol, and observed amoeboid movements in the clot formed after they had been transferred to plasma in flat capillary tubes.

In conclusion, I would suggest that the extraordinary differences of opinion regarding antiseptics are due to failure to recognize their two distinct uses, and the properties they must possess for each of these. When used for periodical irrigation with a view to diminishing the number and virulence of the organisms on the surface of a wound, the antiseptic should (1) be cheap; (2) kill rapidly in the presence of a little albuminous or cellular material; (3) should not unduly harm the tissues; and (4) have any noxious properties rapidly quenched. When used for dressings applied to infected tissues it should at least (1) act in a thick suspension of infected corpuscles in liquor puris or serum; and (2) not inhibit phagocytosis. For the first purpose hypochlorous solutions appear to be the best at our disposal; for the second, while these solutions are useless, flavine may prove to approach the ideal more closely than any antiseptic at present available.—I am, etc.,

WM. PARRY MORGAN, Temp. Capt. R.A.M.C.,
Bacteriologist Lord Derby War Hospital.

Warrington, Jan. 22nd.

THE TREATMENT OF CANCER BY CUPRASE.

SIR,—In your issue of January 13th a correspondent records an unfavourable experience on one case.

I wish to record a favourable experience on one case, that of a woman aged 38, with cancer of the uterus. She had been discharged from a hospital as inoperable. The diagnosis is not in doubt. When the patient came under my care first she was painfully emaciated, and suffered from frequent attacks of hectic fever with night sweats, and considerable pain and discharge from the vagina. The slightest examination caused profuse haemorrhage.

I have now given seven injections. Improvement started from the first injection. Only slight pain local to the site of injection occurred, lasting a few hours. The local reaction in the skin was also limited to some redness. The skin generally of her body and face has now a slight coppery tint. All pain has ceased, the discharge is less, hectic fever and night sweats have stopped, appetite has improved, and with it the body weight. In these circumstances I am going to continue the injections.—I am, etc.,

Lewes, Sussex, Jan. 20th. H. VALLANCE, M.R.C.S.

THE ALGOID STAGE OF BACILLI AS A HYPOTHESIS.

SIR,—Among the many unorthodox papers that recently have been shedding light on the obscurity of modern bacteriology there is none more notable than that of Professor Adami in the BRITISH MEDICAL JOURNAL of October 14th, 1916. He accepts as fully demonstrated by Hort and Caulfeild that the cause of cerebro spinal meningitis is not the meningococcus but an ultra microscopic organism that can pass through an ordinary bacterial filter. Moreover he claims that the instance of cerebro-spinal meningitis is by no means isolated; it is only one of a group of diseases the causation of which has been wrongly ascribed to specific bacteria which are found in frequent but not constant association with the disease, whereas the real cause is a filter-passing organism whose relation to the specific bacillus is at present undetermined. The group comprises the well known swine fever formerly ascribed to *Bacillus suipestifer* but now admitted to be due to a filter passer, scarlet fever in man formerly assigned by some to a streptococcus, distemper in dogs, dengue (an addition to Adami's list), and the most alarming and revolutionary of all, enteric fever, still ascribed almost universally to the *Bacillus typhosus*. Even those who were not experts in bacteriology have been aware for some time that the relations of the typhoid bacillus to the other members of the *coli* group, a group universally present in the intestines of a normal healthy man, were in a state of chaos. But it will come as a shock to most to learn "that although a stock culture of *Bacillus typhosus* when killed will cause immunity, when living it will not cause the disease. At least, no one, so far, has been successful in reproducing the symptoms and specific lesions of enteric fever in man or in an animal by the employment of a stock culture of the typhoid bacillus."

In India the shock will perhaps not be so great, for we have been long familiar with Cunningham's demonstrations, frequently repeated on the continent, that the swallowing of large doses of cholera culture almost invariably fails to produce cholera. With Cunningham's experiments the failure was invariable. When the man of ordinary accepted bacteriological tenets is confronted with the inclusion of enteric in the group caused by filter passers, he will probably comfort himself by the reflection that, after all, even the heterodox admit that the *Bacillus typhosus* causes immunity; therefore it must be the cause of the disease, says orthodoxy. But his comfort rests on a very insecure basis, for there are many known instances of heterologous immunity, and that most amazing and unexplained result of the immense experiment in South Africa of immunization against pneumonia, an experiment that ran to hundreds of thousands, Immunity against pneumonia was indeed produced, but so was an almost equal immunity against other diseases.

The exact relation of the filterable virus to the associated bacillus is apparently still a matter of doubt. "Previous workers have at most suggested a symbiosis; that the one, the filterable virus, prepares the way for the growth of the bacterial species. Hort suggests, and believes that he has evidence supporting the suggestion, that filterable virus and coccus are two phases in the life-history of one organism."

On analogy Hort's theory seems to be very probable, particularly if one recalls the sexual generation of the ordinary simple alga. The morphological difference between an alga thread and a bacillary thread is negligible except in scale. In both you have a chain of cells of similar structure with the main difference that the algal cells contain chlorophyll and the bacterial cells do not ordinarily. The sexual reproduction of the algal thread is that one cell of the thread becomes large and swollen, and breaks up into a large number of minute free swimming female gonads. Another sexual cell without preliminary swelling and enlargement develops and gives issue to smaller free swimming male elements. The two conjugate and the result is an ordinary algal thread reproducing itself by cellular division just as does the ordinary bacterial thread. Now imagine for a moment that in the bacterial thread a similar process takes place.

With most bacilli if the gonads as regards size bore the same relation to the bacterial cell as to the algal cell, the sexual elements would certainly be ultra-microscopic, and capable of passing through a filter. With regard to the probability of the sexual process setting free substances that would act as toxins or disease producers we have the analogy of the malarial organism. It is only when the free swimming elements are being set free in the blood that the fever paroxysm is produced.

I do not for a moment definitely assert that such a sexual process in bacilli as has been indicated does actually occur; I make it only a possibility requiring endless research before the point can finally be settled. Equally I do not assert that all disease is due to filterable organisms, and that bacilli may not be the actual instead of the associated cause in some disease conditions, such as gas gangrene, for instance, and ordinary sepsis.

But when one surveys the field of zymotic disease—mumps, measles, small-pox, chicken-pox, typhus, dengue, yellow fever, and the like—then we are at once confronted with the fact that all the efforts of the bacteriologists working for some forty years have been unable to establish that a single one of them is due to a specific bacillus. The presumption is inevitable that zymotic

diseases are not due to bacilli. On the other hand, it has been proved that many of the zymotic diseases of men and animals—for example, swine fever, dengue, typhus, and yellow fever—are caused by filter passers; therefore the presumption is that all zymotic disease is due to filter passers. These are mere hypotheses, which have to be tested. In other epidemic diseases—notably cholera and enteric—there is grave doubt as to whether the specific bacillus assigned to them is the real cause. It seems more probable that these also are due to filter passers.

What still further complicates the question is that the relation of the bacillus to the filter passer is still unsettled. There again at least three hypotheses are possible: First, that the relationship is purely accidental, owing to the universal presence in nature of bacilli. Secondly, that the relation between the bacillus and the filter passer is merely one of high association—symbiosis. This possibility cannot be denied if we remember that certain orchid spores will germinate only in association with certain fungi. The third hypothesis I have already described at some length, that the relationship between the filter passer and the bacillus is genetic, that the bacterial thread is merely an algoid stage, the sexual free swimming stage of which—namely, the filter passer—is the real cause of disease. A fourth hypothesis I mention merely in order to discard it. From the minute quantities used, I refuse to believe it possible that the results ascribed to filter passers are really due to associated bacterial toxins.

Which of all these hypotheses is most likely to prove correct I do not venture to predict, but personally I am in favour of the one that makes disease in general due to filter passers.

It seems clear, as I have already suggested in a previous paper,[1] that the whole subject of modern bacteriology requires a systematic international overhaul.—I am, etc.,

Calcutta, Nov. 16th, 1916. W. C. Hossack.

Note.—The title of my letter may suggest I am in sympathy with Dunbar's idea that bacilli are the products of algae. In 1913, in his laboratory in Hamburg, he gave me a demonstration of his culture and an explanation of his views. Both demonstration and explanation struck me as unconvincing and left one crucial point unexplained—that is, how he originally obtained living sterile algae.

THE INCOMPLETE CURE OF THE CONSUMPTIVE.

Sir,—The naïveté of Dr. Ferdinand Rees's letter is delightful. Would that we lived in Utopia! and could dispense with money! Imagine the cost of "hospitals for suspected cases," of "sanatoriums for undoubted cases with a chance of cure," and of "open-air colonies for incurable cases."

In time, when experts have more influence than amateurs, most cases of tuberculosis will be treated at dispensaries by specific remedies, notably tuberculin. In this way the enormous cost of housing and feeding at public institutions will be saved, and a proportion of this saved money may well be spent in improving the homes of many of the victims.

Sanatorium benefit as administered by the Insurance Committees is honeycombed with arrant amateurism; and much of the money is devoted to purposes of public health, instead of the treatment of the unfortunate sufferer, who has paid his insurance money for *treatment*. —I am, etc.,

London, W., Jan. 20th. W. Camac Wilkinson, M.D.

Sir,—Whilst agreeing with much that is said in your leading article on the incomplete cure of the consumptive (January 13th, 1917), about the waste of sanatoriums through treating incurables, yet towards the end there seems to be a suggestion of a scheme for the compulsory segregation of incurables, and I suppose also of the permanently infectious. I think that if this matter be considered from all standpoints it will be realized that a system of compulsion could only affect comparatively few infectious patients; whilst if such a scheme were put into operation it would become impossible to obtain cases which are curable for treatment. Our chief difficulty at the present time in obtaining early cases is that such people prefer to run any risks rather than come under the stigma of the Notification Act, though compulsory notification is a good thing when no pains and penalties are attached. By explaining to patients and practitioners that no consequences, civil or otherwise, will follow upon treatment, we have been able, in the case of three towns at least, each of 5,000 inhabitants, to get the great majority of persons suffering from pulmonary tuberculosis to be treated either in the sanatorium or in hospital. It is clear that if this is to continue compulsion must not be used.

For some years very little has been done by most authorities, except to attend to hopeless cases, with results less than negligible; surely it behoves us now to commence and treat these cases, if possible, before tubercle bacilli are demonstrable in the sputum.—I am, etc.,

Edward E. Prest.

Ayrshire Sanatorium, New Cumnock, Jan. 15th.

[1] Hossack, *Indian Medical Gazette*, May, 1916, to which readers may be referred, as it has been necessary to omit some passages from our correspondent's very long letter.

PSYCHO-ANALYSIS.

Sir,—Psycho-analysis, as I understand it, is not a body of doctrine, but an investigation conducted by special methods, chief of which are (1) Freud's method of "self-observation with suppression of critique," and (2) Jung's "association experiment." Of these, the second at any rate (involving, as it does, the use of the stop-watch) appears to admit of some precision, and may therefore be expected to yield some results not void of significance. How far the results obtained by these methods justify the doctrines which Freud and Jung profess to have based upon them may rightly be questioned, but it would be a misfortune if any useful method of research were discredited by the abuse now being heaped upon those doctrines. The title of Dr. Mercier's article in your issue of December 30th, 1916, is unfair. It is open to him to show, if he can, what is the proper significance of results obtained by psycho-analytic methods, or that the methods are untrustworthy, and, if so, in what respects, and why? Such criticism is, on several grounds, much to be desired, but it finds no place in Dr. Mercier's article, nor in the letters that have since been published in his support. They leave psycho-analysis unassailed.

That Dr. Mercier should have published such an article under the title of "Psycho-analysis" is as if a pathologist should fill six columns of your Journal to proclaim that the reason why he eschews *post-mortem* work is because the atmosphere of the *post-mortem* room is unsavoury, while salving his conscience by accusing those who work there of ghoulishness. If Dr. Mercier finds psychology so distasteful, he may employ his pen in some other sphere. He might do worse than try to show that English surgeons should abandon the use of *x* rays on the ground that the name Röntgen sounds German.—I am, etc.,

County Asylum, Devizes, Jan. 20th. Sydney J. Cole.

Sir,—I regret that in my letter to you on the above subject in your issue of January 6th, 1917, I signed myself "President of the Medico-Psychological Association." I should not have done so, as it invested my letter with undue authority, whereas my general adhesion to Dr. Mercier's views expressed in my letter is merely my own personal opinion. In no sense did I intend to convey that my views were those of the Association.—I am, etc.,

Norwich, Jan. 23rd. D. G. Thomson, M.D.

Sir,—In winding up this discussion, I draw attention to the fact that no psycho-analyst has come forward under his own name to deny the accuracy of the account I have given of the doctrine. We may therefore take it that this account is accurate. Dr. Hughes, it is true, accuses me by implication of misrepresentation, but he does not venture to make a direct accusation, nor does he point to any specific misrepresentation. Such a charge needs no answer, but I will answer it by pointing out that in every case but those in which the doctrines are too notorious to require it, I gave quotations to substantiate my account.

Dr. Glover says my account of the unconscious is unfair. It is the best I could give. If Dr. Glover is dissatisfied with it, why does he not give a better one? He says my

allusion to growth from within is an allusion to the unconscious. Does, then, an endogenous tree grow out of the unconscious? He says that to insist that "these misguided folk" (his own description of the psycho-analysts) "who troop with indefatigable enthusiasm after the Will-o'-the-wisp of the 'unconscious,' are in reality lascivious scoundrels and sexual perverts, is a mode of intellectual criticism which," etc. I dare say it is; but as I have not insisted on any such thing, Dr. Glover's intellectual criticism does not touch me. What I have said is that, though the doctrine of universal saturation with sexuality is not generally true, there is a certain basis of truth in it in a few scattered cases. If Dr. Glover denies this, I am quite willing to retract, and to admit that there is not the slightest basis of truth in the doctrine in any case whatever.

"Psycho-analyst" does not seem proud of his creed, for he conceals his name. He asserts, as has been asserted before, that psycho analysis contains much that has no connexion with sexual ideas; and I ask, as I have asked before, why, if this is so, we never hear of anything but the sexual ideas? The question will be left unanswered now, as it has been left unanswered before. Why, if the connexion is not constant, does Dr. Jung say of a case which seems as remote as possible from sexuality, "I will now show you how . . . this dream may be translated so that it has a sexual meaning"? Whether I can see or even conceive of any other aspect of the problem is beside the point. The point is that no other than the sexual aspect has ever been brought forward. The rest of "Psycho-analyst's" letter needs no answer. If this is the best defence they can make, their case is as contemptible as I have asserted.

Fleet Surgeon Beadnell opens up a new subject. The stupidities and the imposture of what he calls mediumism and spiritualism have been exposed over and over again; and after each exposure the imposture is scotched for a time; but it always rears its head again, and finds a new crop of fools clamouring to be deceived. It will never be killed until the supply of fools ceases; but if Fleet Surgeon Beadnell needs powder and shot to demolish any particular case that he has in his eye, may I without impropriety refer him to the chapter on Belief, and the chapter on Errors in Attributing Causes, in a little book of mine on *Causation*, just published by Messrs. Longmans? There he will find psycho-analysis also faithfully dealt with.

Finally, may I say that a second severe attack of influenza within a fortnight has left my correspondence in sad arrear, and that I wish to acknowledge here the many letters I have received from friends, acquaintances, and strangers, approving my article on psycho-analysis, and thanking me for it? There has not been one, not even an anonymous one, of abuse or disapproval. How different from the days of the suffragette controversy!—I am, etc.,

Parkstone, Dorset, Jan 20th. CHAS. A. MERCIER.

Postscript.—The Editor has kindly allowed me to see a proof of Dr. Cole's letter. Dr. Cole says that psycho-analysis, as he understands it, is not a body of doctrine, but an investigation, and that Freud and Jung profess to base their doctrines on their results. If this is what Dr. Cole understands by psycho-analysis, he does not understand it aright. It consists of several modes of investigation, founded, not on their results—it is evident that a mode of investigation must precede any results accruing from it, and cannot be founded on them—but on certain assumptions, which the psycho-analysts teach, and which are therefore their doctrines. These doctrines are not founded upon results. They are pure assumptions. I have demanded again and again for years past to be told on what foundations they rest, and I have had no answer. I am entitled to say, therefore, that they have no foundation. I have heaped no abuse upon these doctrines. I have described them, and examined them, and the accuracy of my description has not been impugned in any particular, nor is it impugned in any particular by Dr. Cole. It must therefore be taken to be accurate. The only expression in my article that can by any stretching of the use of words be termed abusive is that in which I compare the psycho-analyst to the man with the muck-rake. It is difficult to see why those who hold such doctrines and pursue such methods should object to the comparison. For my part, I would rather be called a man with a muck-rake than a psycho-analyst. The man with the muck-rake rakes up the muck, but he does not increase it, nor does he wallow in it. Lastly, if I have left psycho analysis unassailed, what has Dr. Cole to complain of? What is his grievance? If it is unassailed, it is secure and triumphant, until it falls to pieces of its own rottenness.

January 23rd. C. A. M.

⁂ We cannot continue this correspondence.

THE PSYCHO-PATHOLOGY OF MEDIUMISM AND SPIRITUALISM.

SIR,—Fleet Surgeon C. Marsh Beadnell complains that no psychologist has investigated occult phenomena. A very eminent Italian one, Cesare Lombroso, has done so. Permit me to recommend to him his book, *After Death—What?* (T. Fisher Unwin, Adelphi Terrace).—I am, etc.,

Rotherham, Jan. 22nd. GILBERT E. MOULD.

THE DIAGNOSTIC VALUE OF THE COLLOIDAL GOLD REACTION.

SIR,—With reference to the article on this subject in your issue of December 30th, 1916, pp. 909 and 910, a few notes on the subject from our own laboratory experiment book may perhaps be of interest.

Some six to eight months ago the Lange gold sol reaction was explained to the writer by the commanding officer of a well-known London military hospital, who also kindly supplied a number of normal and syphilitic serums for ultra-microscopic examination. Briefly, to the student of colloidal chemistry, serum may be regarded as a saline colloidal solution of insoluble protein protected to a greater or less extent by soluble protein (various aliphatic amino-acids). The total amount of solid matter in syphilitic appeared slightly higher than in normal serum, but undoubtedly the proportion of colloidal matter was greater, and this was much more pronounced in the cerebro-spinal fluid, in which the viscosity being so much less, the Brownian movement is much greater. Invariably the charge carried by the protein was positive, the capillary attraction by filter paper, devised by W. Ostwald, being the simplest method of effecting the test.

The interesting work of Morris-Airey and Long (J. C. S. A., November, 1913, page 1033) on the colour of gold sols is of particular interest. In the red solution the particles are negatively charged, and in the blue positively. The purple solutions contain both kinds of particles. The red solution is converted into the blue by the action of various electrolytes or electric fields. If the field is either too strongly negative or positive decolorization occurs.

The colloidal protein in the cerebro-spinal fluid is greater than normal in syphilis and possibly more highly charged; and herein may perhaps lie the explanation of the colour changes of Lange's gold sol. In cases where the particles are very numerous the field would be strongly positive, and not only neutralize the negative charge of the gold, but completely change the field into a positive one—so strongly, in fact, that decolorization occurs. In the next dilution the field is not so strongly positive, but sufficiently so to turn the negative red to the positive blue, and so on until dilution is so weak as to unaffect the red colour at all. Our observations were made on only a small number of specimens, and may very possibly be erroneous and the explanation too simple.

In conclusion, we should like to suggest that the statement "globulins have been shown to exert a protective influence on colloidal gold solutions" would be better expressed by "*soluble* globulins have been shown," etc., etc.

—I am, etc.,

JOHN WARD,
for Crookes Collosols, Ltd.

THE FUTURE OF THE MEDICAL PROFESSION.

SIR,—"Captain T.F." states, in your issue of January 20th, that "a State medical service, with its inevitable loss of competition, is bad for public and profession alike." Has he found it so in the army, or even in the Army Medical Service?

It seems to me that when professional men, such as soldiers or doctors in one of the public services, are paid by salary, they become more disinterested and independent, and are held in higher estimation by the public than when, as doctors or solicitors in general practice, they earn fees.

Our motives in paying visits and making up medicines and vaccinating babies may be questioned when we profit thereby. I think that the argument from competition is in favour of a public medical service, as we would be promoted in accordance with our experience and skill by the State. Under present conditions success comes to the

genial man with ready wit and confident manner, who may or may not be skilful professionally. The public judges rather by manner than results, and success comes to the plausible.—I am, etc.,

Hartland, North Devon, Jan. 21st. RICHARD KAY, M.B.

MOBILIZATION OF THE PROFESSION.

SIR,—In your leader on this subject you say the proposal has deeply moved all its members. Undoubtedly it has some, and in different ways; but I am afraid there are very many more who, by reason of the exacting nature of present demands on their time, know little of the proposal or what it involves for the rank and file of the profession, or there would be most vigorous opposition. I cannot imagine the profession would knowingly and voluntarily hand over what remains of its freedom, and actually seek to be put under compulsion, irrespective of age, circumstances, or fitness.

I believe the profession is as patriotic as any other body of workers, and perhaps more so; for our gratuitous work for the public and country is almost unlimited, and the contribution to H.M. Forces a most honourable one, but to ask that every man on the *Register* shall deliver himself up ready to go anywhere and do anything he may be told is surely not only unnecessary, but unbusinesslike and absurd. Imagine the confusion, chaos, and expense were the suggestion of your correspondent "S." for a sort of general "all change" adopted!

If all this were necessary to the winning of the war no reasonable individual would object, but is it? The military authorities may be trusted to secure all the available officers they need, and other machinery is in existence to arrange where they can safely be taken from, and to conserve the interests of those taken.

In spite of this, it appears to be suggested that we should all be handed over to the arbitrary disposal of compulsion, which need not consider age, fitness, qualification, or circumstances, and, indeed, will know little about them.

Take the case of a man who, quite unfit for military service, is able to do useful work in his own time and way, in his own practice and for absentees. Transfer him from the place he has chosen because of his limitations to another locality away from all that has made his work possible, and his usefulness is destroyed, and he will probably completely break down.

Let us do everything we can to serve our country and to protect our absent colleagues. Make it compulsory if you like for each practitioner at home to disclose a list of new patients who have come to him for the first time since his absent neighbour was called up, or any other fair means of ensuring that an absentee's patients shall not be taken; but before it is too late, and our leaders have betrayed us into bondage, can we not do something to show most plainly that they have no right or mandate from the profession to give us away so hopelessly?

I hope others with more ability to voice the views and feelings of the rank and file will take up this matter.—I am, etc.,

January 22nd. REJECTED.

Universities and Colleges.

UNIVERSITY OF CAMBRIDGE.

THE following degrees have been conferred:

M.B., B.C.—A. Orr-Ewing, V. C. Pennell, N. S. Tirard
M.B.—C. H. M. Gimlette, R. S. Woods.
* Admitted by proxy.

UNIVERSITY OF LONDON.
UNIVERSITY COLLEGE.

A SPECIAL Introductory medical course in physics, chemistry, and biology for students desirous of beginning their medical studies will be held at University College, and will begin on March 1st. Intending students should communicate forthwith with the Secretary, University College, London (Gower Street, W.C.).

CONJOINT BOARD IN SCOTLAND.

THE following candidates have been approved at the Final Examination in the subjects indicated:

Medicine—R. N. Burton, F. J. Jack, Mary G. Jones, J. B. Minford.
Surgery.—Don Adrian Jayasinghe.
Midwifery.—B. Ajayi-Young, R. C. Battersby, A. E. Elliott, F. J. Jack, G. A. Grandsoult.
Medical Jurisprudence.—A. E. Hempleman, A. P. McLeod, R. Pollok, J. Michaelson, Arukatti Patabendige Frederick Abeysuriya, J. L. West, A. I. Meek, D. Stewart, F. J. Jack, D. C. Howard.

The following have been admitted L.R.C.P.E., L.R.C.S.E., L.R.F.P. and S.G.:

W. F. Mason, J. A. Tolmie, J. W. Gordon, R. F. C. H. Buchanan, A. Black, Yeshwant Narayan Kadam, J. Berry, A. D. Gorman, W. T. Garretson.

Public Health
AND
POOR LAW MEDICAL SERVICES.

VITAL STATISTICS IN ENGLAND AND WALES, 1916.

WE are indebted to the Registrar-General for the following statement showing the birth-rates and death-rates and the rate of infantile mortality in England and Wales and in certain parts of the country during the year 1916.

ENGLAND AND WALES.
Birth-rate, Death-rate, and Infant Mortality during the Year 1916 (Provisional Figures).

	Death-rate per 1,000 Living.*	Death Under One Year per 1,000 Births.
England and Wales...	14.0	91
96 great towns, including London (Populations exceeding 50,000 at the Census of 1911)	14.4	98
148 smaller towns (Populations from 20,000 to 50,000 at the Census of 1911)	13.0	90
London	14.3	87

* The death-rate for England and Wales is based upon deaths in the whole population and an estimated total population of 36,250,000 The birth-rate similarly calculated is 21.6 per 1,000. The death-rates for the towns are based upon civil deaths and estimated civil population. The birth-rates cannot be stated In all cases the population used relates to the year 1915.

Obituary.

GEORGE MUNRO SMITH, M.D.,
CONSULTING SURGEON TO THE BRISTOL ROYAL INFIRMARY.

DR. MUNRO SMITH, who died on January 13th, was the son of Mr. W. Smith, who practised for many years in Clifton. He received his early education at Clifton College, and entered as a student in Bristol Medical School in 1874. He studied with exemplary diligence in the wards of the Royal Infirmary, and won the Clark Scholarship and gold medals for medicine and surgery. He took the diploma of M.R.C.S. in 1879, and that of L.R.C.P. in 1880. Returning to Bristol, he was made lecturer on physiology to the Bristol Medical School, and his connexion with the Royal Infirmary was renewed when he was chosen as demonstrator of morbid anatomy. He was elected assistant surgeon in 1889, and he became full surgeon in 1897; on his resignation in 1909 he was placed on the consulting staff. His interest in the Royal Infirmary never flagged, and at the request of its managing committee he undertook to write its history. Fortunately Dr. Munro Smith was able to complete the revision of this work before his decease, and we understand that it will shortly be published by Messrs. Arrowsmith. He was president of the Bath and Bristol Branch of the British Medical Association in 1909.

In 1912 Dr. Munro Smith received the diploma of M.D. Bristol *honoris causâ*. He was on the staff of the 2nd Southern General Hospital with the rank of Lieutenant-Colonel R.A.M.C.(T.). He attended the hospital at Southmead daily, and did not cease to discharge his duties until compelled to do so by serious deterioration of his health.

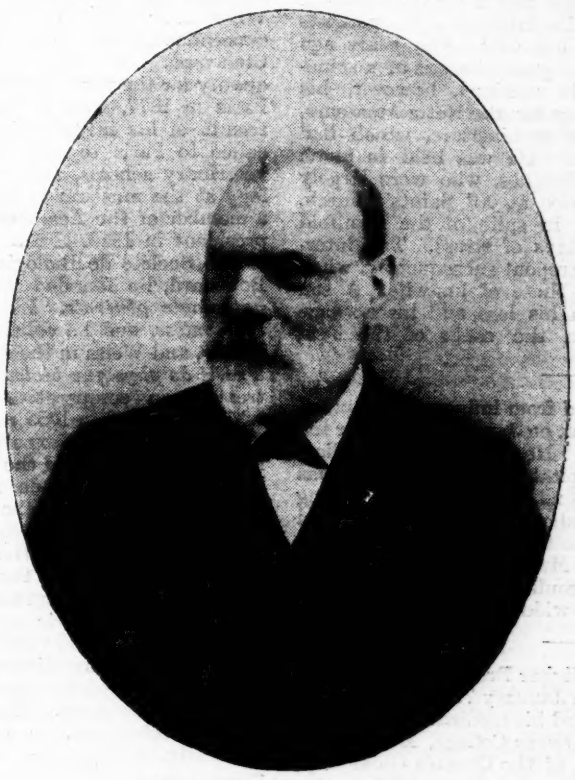
Dr. Munro Smith will be remembered by some of the readers of the JOURNAL for his contribution "On the varieties of hepatic cirrhosis" (vol. i, 1888, p. 1381), which led to a correspondence with Dr. Robert Saundby on the question of a tuberculous type of that disease. Dr. Munro Smith also wrote in the *Bristol Medico-Chirurgical Journal* of 1884 on "The cardiograph in medicine," and contributed to other medical serials. He was a keen lover of animals, and was President of the British Naturalists' Society. Being a good amateur actor he greatly aided the local medical dramatic club in attaining success.

DUNCAN BURGESS, M.B., F.R.C.P.,

LATE SENIOR PHYSICIAN, ROYAL HOSPITAL, SHEFFIELD.

WE regret to record the death of Dr. Duncan Burgess, which took place in Sheffield on January 17th at the age of 66.

A native of Scotland Dr. Burgess commenced his academic career at the University of Aberdeen. After taking the degree of M.A. there he proceeded to Cambridge: he was thirteenth Wrangler in 1876 and was elected a Fellow of Corpus Christi College. At Cambridge he commenced his medical career; he went afterwards to the London Hospital and graduated M.B. in 1882. He studied subsequently at various universities on the Continent, including Prague, Würzburg, and Vienna. In 1887 he became Member and in 1905 was elected Fellow of the Royal College of Physicians of London. His connexion with Sheffield dates from 1887, and for many years he was a physician to the Sheffield Royal Hospital, retiring as senior physician on reaching the age limit in 1915.



DR. DUNCAN BURGESS.

He took an active part in the teaching of medicine in the Sheffield Medical School. He lectured on medicine in the Sheffield University College, and later became professor of medicine in the Sheffield University. He was long a keen and energetic member of the Sheffield Medico-Chirurgical Society, of which he was secretary for some years and in 1899 president. In 1890 he was deputed by the society, with Dr. W. S. Porter, to visit Germany and report on Koch's tuberculin treatment. In 1905 he was elected president of the Sheffield Literary and Philosophical Society.

On the outbreak of war he was called upon to take an active part in the work of the 3rd Northern General Hospital (T.F.), of which he was officer in charge of the medical section, with the rank of lieutenant-colonel. He performed his military duties with great devotion for nearly two years, and in all probability the additional stress materially hastened his final illness.

By his death the profession in Sheffield has lost a loyal friend and an able and gifted colleague. To the younger men in the profession he never failed when the opportunity arose to hold out a helping hand. To all he was genial and kindly, and he succeeded in no small measure in winning the affection of patients and colleagues alike. In his profession a deep reader and keen critic, beyond it he possessed a wide knowledge of literature and a sympathetic interest in men and affairs. A great raconteur, a great lover of his native Scotland, an ideal host—for these things, hardly less than for the professional attainments, he was esteemed by those who knew him.

Lieutenant-Colonel SINCLAIR WHITE, Professor of Surgery in the University of Sheffield, sends us the following tribute to his colleague and close friend:

Born at Grantown-on-Spey, Duncan Burgess was a splendid type of the Highland Scot. Of fine physique, possessed of a herculean strength, and a rugged but kindly face, he embodied in a very high degree the best qualities of his native race. Reserved but always courteous to strangers, he had the faculty of arousing and reciprocating strong and lifelong friendship among those who were privileged to enjoy his close fellowship. He could at times be a fierce critic, but his strictures were always accompanied by some humorous or complimentary remark which robbed the sting of its pungency. Hospitable to a fault, singularly unselfish in all his acts, invariably kind and helpful to his younger colleagues, often insisting that they should take sole credit for work that was largely his own; a lover of children and animals, and withal a good story teller and a keen sportsman.

With these qualities it goes without saying that he was universally popular. Whether on the golf links, where he spent much of his leisure time, and where his Scottish humour was at its best, or in hospital among his patients, or in the classroom where succeeding generations of students learnt by precept and example from a beloved master, he was without peer. On the outbreak of war he threw all his energies into his work as officer in charge of the medical section of the 3rd Northern General Hospital, and there can hardly be a doubt that the arduous duties of this office brought on the disease from which he died. He was buried in the beautiful churchyard at Fulwood on January 20th, in the presence of a numerous body of mourners, and with military honours.

One of his colleagues writes:

The loss of Dr. Burgess is widely and deeply felt in Sheffield, the city of his adoption. Few men have been so universally respected and beloved as he. Wide reading, quick observation, and an excellent memory contributed to the value of his practical experience as a physician, whilst his courteous manner, his candour, and his modesty gained the admiration of all his colleagues and of a large circle of patients and friends. His judgement was sound and rapid, and his character was marked by strong common sense. Too stable to be readily deceived by words and phrases, he gave no encouragement to showiness or credulity in the practice or study of medicine.

That the trustworthiness which characterized his professional career was early developed seems shown by the following incident. At the final M.B. examination another candidate with the same initials as Duncan Burgess was rejected, and, by a confusion of the two names, Burgess was informed that he had failed to pass, and so telegraphed home. His mother read out the telegram, and then quietly remarked, "Oh! no: there is some mistake. Duncan has never failed in anything, and he has not failed now." Shortly afterwards a second telegram was received from him with the correct information that he has passed.

His generous help and sympathy, his genial companionship, and his interesting conversation, will long live in the affectionate remembrance of many who have experienced them.

JAMES HUNTER JOHNSTON, a native of Skipton, Yorkshire, died on January 4th at his residence at Nottingham in his 52nd year, after a long and trying illness cheerfully and courageously borne. He was educated at Skipton School and afterwards at Owens College. He received his medical training at the University of Edinburgh, graduating M.B., C.M. in 1892. He was a steady student, a keen cricketer, becoming a member of the university eleven, often scoring freely, and at times meeting with some success as a change bowler. After graduation he obtained house appointments, both on the medical and surgical sides, at the Edinburgh Royal Infirmary, and also held appointments at the Royal Asylum, Morningside, the Edinburgh Fever Hospital, and the Crichton Royal Institution, Dumfries. For many years he had practised in Nottingham, and in his earlier years there did pioneer work, of much value to the profession locally, in securing improved terms and conditions in relation to contract practice. He took a somewhat prominent part in the discussions during the period just anterior to the introduction of the Insurance Act, and was subsequently a member of the Nottingham Panel Committee. Dr. Johnston was a good type of general practitioner and a kindly, cultured English gentleman, who placed the interests of his patients before his own. The loss of his wife some years ago affected him greatly, and in later years he was of a somewhat retiring disposition. He retained, however, his interest in cricket, often playing for the Notts Amateurs, while his favourite hobby was architecture, which had attracted him in student days. He was held in much esteem by his professional colleagues, who were largely represented at the funeral service at All Saints' Church, Nottingham, on January 8th, in spite of the manifold claims on their time in these days of stress. The interment took place at Holme Pierrepont subsequently, when his remains were placed beside those of his wife. A son and daughter are left to mourn his loss, and his absence will leave a sensible gap in the ranks of the local profession.

MR. SIDNEY BAZALGETTE died from influenza and pneumonia at Brent Knoll, Somerset, on January 7th, after ten days' illness, at the age of 38. He received his medical education at St. Thomas's Hospital and took the diplomas of M.R.C.S.Eng. and L.R.C.P.Lond. in 1904. After serving for some years as assistant medical officer at the Bristol City Asylum he succeeded some two and a half years ago to the practice of the late Mr. Mugliston at Brent Knoll, where he won the respect and confidence of an increasing circle of patients. He leaves a widow to mourn his loss.

DR. J. WILSON HAMILL, of Higher Broughton, died from pneumonia and heart failure on January 7th, aged 63, after a few days' illness. He received his medical education at Queen's College, Belfast, and Owens College, Manchester, and took the degrees of M.D. of the Queen's University, Ireland, in 1873, and the M.Ch. and L.M. in 1874. After holding the posts of resident surgeon to the Worksop General Dispensary and surgeon to the Worksop Cottage Hospital he set up in practice at Higher Broughton thirty-five years ago. He was physician to the Greengate Hospital and Dispensary, Salford, and to the Retreat for Inebriate Women, Fallowfield. Dr. Hamill was associated with his wife in a number of social, philanthropic, and temperance movements. He had been a member of the British Medical Association, and was a frequent attendant at the annual meetings.

THE death of Mr. ANDREA ANGEL, the expert chemist of the munition factory at which the explosion took place last week in the east of London, who gave his life in an attempt to get workers out during the fire which preceded the explosion, will be much felt in Oxford, where his work was very highly appreciated. He was educated at Exeter Grammar School and went into residence at Christ Church College, Oxford, in October, 1896, having obtained a college exhibition in chemistry in the previous December. In 1899 he obtained an excellent first class in honours in chemistry and proceeded in due course to the degrees of B.A. and M.A., to which he added B.Sc. in 1906 by a research in chemistry. He acted for a time as a demonstrator in the Christ Church Laboratory, and since 1903 had been tutor to the non-collegiate students at Oxford; since 1906 he had been lecturer at Brasenose College, and he became lecturer also at Christ Church in 1912, with complete supervision of all the chemical work in the college. He did no specially brilliant work as a chemical researcher, but his knowledge was exceedingly wide and sound, and as a tutor his work was beyond praise. He was o a quiet disposition, but cheerful in the highest degree and most popular with his pupils and colleagues. He knew well the perils of the munitions work in which he was engaged, and the supreme heroism with which he faced the hour of danger will have come as no surprise to those who knew his quiet determination and sense of duty.

PROFESSOR A. CHAUVEAU, a pioneer in several new paths of physiological and pathological research, died recently at the age of 89. Born at Villeneuve-le Guyard in the department of Yonne in 1827 he entered the Veterinary School of Alfort in 1844, passing out first at the final examination in 1848. In the same year he was appointed *chef de service* in the veterinary school of Lyons, becoming professor of anatomy and physiology in 1863, and director in 1875. When the medical faculty was reorganized, the chair of experimental and comparative pathology was offered to Chauveau. Not being a doctor of medicine he had to qualify for the post by taking the degree, which he did at Paris in 1877, with a thesis in which he embodied the results of his investigations on vaccine. In 1886 he was called to Paris to hold the posts of inspector-general of veterinary schools, and professor of comparative pathology at the museum of natural history. He was elected a member of the Académie de Médecine, of which he was president in 1913. From 1892 to 1897 he was president of the Société de Biologie. In 1899, in conjunction with Bouchard, he founded the *Journal de physiologie et de pathologie générale*. Later he founded the *Revue de la tuberculose*, and he collaborated with d'Arsonval, Gariel, Marey, and Weiss in the direction of the publication of the *Traité de physique biologique*. He was the author of a treatise on comparative anatomy, the first edition of which appeared in 1855 and a fourth in 1889. Later he devoted himself to experimental research on the physiology of the heart and the general mechanism of the circulation. He also made researches on the working of muscles, formulating the law which bears his name—the expenditure of energy by a muscle is proportional to its shortening and to the weight lifted. Chauveau also published memoirs on the excitability of the spinal cord, on the origin of the cranial nerves, and on the part played by the pneumogastric nerve in contraction of the oesophagus. He studied vaccines and their relation to smallpox. He also investigated the pathogenesis of tuberculosis, and noted the transmissibility of the infection by the alimentary tract. He was one of the first to maintain that microbes act, in causing disease and producing immunity, through the soluble substances to which they give origin.

SURGEON-GENERAL SIR EDMOND TOWNSEND, K.C.B., Army Medical Staff (retired), died at Clontymore, co. Cork, on January 2nd, aged 71. He was born on April 22nd, 1845, the son of the late W. C. Townsend, M.D., of Cork, and after taking the degrees of M.A., M.D., and M.Ch. in the Queen's University of Ireland, entered the army as assistant surgeon on April 1st, 1867, becoming surgeon on March 1st, 1873, surgeon major on April 1st, 1879, and surgeon-general on September 25th, 1901. He retired on April 22nd, 1905. He had a very long record of war service, including nine campaigns, as follows: Abyssinia, 1867–68, action at Asirgee, medal. Perak expedition, in Malay peninsula, 1875–76, severely wounded, medal with clasp. South Africa, 1879, Zulu war, battle of Ulundi, and operations against Sekukuni, mentioned in dispatches, medal with clasp. Egypt, 1882, actions of Kassassin and Tel-el-Kebir, medal with clasp and Khedive's bronze star. Burma, 1885–86, medal with clasp. Ashanti, 1886, mentioned in dispatches, star. North-West Frontier, 1897–98, as P.M.O. in Mohmand campaign, mentioned in dispatches; and Tirah campaign, as P.M.O. of 1st Division; actions of Sampagha and Arhanga passes, and operations in Bazar Valley, mentioned in dispatches, medal with two clasps, and C.B. South Africa, 1899–1902, as P.M.O. of 1st Division, and later P.M.O. Western District, actions of Enslin,

Modder River, Magersfontein, and Pardeberg, and relief of Kimberley; dangerously wounded, mentioned in dispatches, Queen's medal with four clasps and King's medal with two clasps, and C.M.G. He received the K.C.B. in 1904.

DR. J. COURTIN, who died on December 9th at the age of 59, was for many years a leading surgeon at Bordeaux. He took his degree there in 1880. He became surgeon to the Children's Hospital and to the Saint André Hospital, to which he remained attached from 1878 till 1912. He won a high reputation both as a surgeon and a teacher. He retired four years ago under the rule as to limit of age, but on the outbreak of the war returned to his post at Saint-André. He worked there and at the auxiliary hospital of La Pouponnière for fourteen months with a devotion which won him the respect and affection of all with whom he came in contact. From 1895 till his death he was general secretary to the Association des Médecins de la Gironde. He was also at various times secretary of the Infant Protection Society, professor at the school for nurses, and President of the Bordeaux Society of Anatomy and Physiology. He was long associated with Professor Massage in the editorship of the *Gazette hebdomadaire des sciences medicales de Bordeaux*, becoming sole editor on the retirement of his colleague. At the Congress of the Assistance Publique in 1903 he was honoured with the Ribbon of Officer of Public Instruction, and at the International Congress on Infant Protection in 1905 he received the "palmes académiques" for the part he had taken in its organization.

BRIGADE SURGEON SAMUEL CORNWALLIS AMESBURY, Bengal Medical Service (retired), died at Dehra Dun on November 8th, aged 84. He was born on November 21st, 1832, the younger son of Mr. Joseph Amesbury, surgeon, London, was educated at King's College, London, and at the Middlesex Hospital, and took the diplon a of M.R.C.S. in 1854, subsequently taking that of F.R.C.S.Edin. in 1866. He was nominated, by Mr. H. T. Prinsep, an assistant surgeon in the I.M.S. from January 14th, 1855, became surgeon on January 14th, 1867, surgeon major on July 1st, 1873, and brigade surgeon on December 3rd, 1883, retiring with an extra compensation pension on April 30th, 1890. During the later part of his service he was medical officer of the Bengal Sappers and Miners stationed at Rurki, and after retiring he practised for some years at Masuri. Though in India during the Mutiny he does not appear to have seen service in that campaign, his only war service being the Hazara campaign of 1868, in the North-West Frontier of India. His elder brother, the late Surgeon Major J. W. R. Amesbury, who died over thirty five years ago, received a Brevet-Surgeoncy for his services in the Mutiny.

LIEUTENANT-COLONEL GEORGE ARCHIBALD MARSHALL, Deputy Assistant Director of Medical Services of the Commonwealth Military Forces, died on December 24th at Darling Point, Sydney, N.S.W., aged 58. He was the third son of the late Dr. Joseph Marshall of Dromore, co. Tyrone, Ireland, and was educated at the Royal School, Raphoe, and at Trinity College, Dublin, where he took the degrees of B.A., M.B., B.Ch. in 1882. He was an officer of the Australian Army Medical Corps, which served during the South African war in 1900–1. He was on active service again when he was wounded by shrapnel in the Dardanelles, and was then sent back to Australia, but pernicious anaemia developed. He had practised in Sydney for over thirty years, and was much beloved and respected by his patients and medical brethren in the city. He has two brothers still in the medical profession.

LIEUTENANT-COLONEL AUGUSTUS NAPOLEON ROGERS-HARRISON, Madras Medical Service (retired), died at Cheltenham on January 1st, aged 67. After taking the diplomas of M.R.C.S., L.S.A., and L.R.C.P.Lond. in 1872, he entered the I.M.S. as assistant surgeon on October 1st, 1872, becoming surgeon on July 1st, 1873, surgeon-major on October 1st, 1884, surgeon lieutenant-colonel on October 1st, 1892, and brigade surgeon lieutenant-colonel on April 7th, 1896, and retiring on January 6th, 1902. Most of his service was spent in civil employ in the Madras Presidency, at Salem and Vizagapatam. The *Army List* assigns him no war service.

The Services.

EXCHANGE.

CAPTAIN R.A.M.C. in charge of troops in Egypt desires exchange with M.O. on home station, hospital, or sanitary. Cardiff or London district preferred.—Address No. 250, BRITISH MEDICAL JOURNAL Office, 429, Strand.

Medical News.

THE council of the London and Counties Medical Protection Society, Limited, has decided to apply for £9,500 Five per Cent. War Loan (£2,100 new money), bringing the amount of the society's investment in war securities up to £10,000.

DR. C. J. WHITBY, well known to many members of the Association as representative for several years of the Bath Division, has published in the Christmas number of *Khaki* a play entitled "The Elder Brothers," which shows his power of dramatic writing to the best advantage. Romantic in form and indeterminate as to time and place, it yet has a symbolic relevance to the state of opinion in the country shortly before the outbreak of war, when we understand it was written.

AT the annual meeting of the Incorporated Midwives' Institute a resolution was adopted strongly opposing the notification of pregnancy, on the ground that it would tend to prevent early engagement of the doctor or midwife and undermine the confidence between the midwife and patient so necessary for effective antenatal care. Another resolution recognized that prenatal care was an important factor in diminishing abortion, stillbirths, and premature labours, and urged that the midwife was a suitable person to give this care since, under the rules of the Central Midwives Board, she had responsibilities towards the patient from the time of booking. For this reason another resolution affirmed that there must be efficient and hearty co-operation between practising midwives and maternity centres.

IT is stated in the German medical press that the decline of the incidence of venereal disease in the army observed between 1870 and 1913 has continued even during the war. Before 1870–71 this incidence was 5 per cent. By 1912–13 it had fallen to 2.12 per cent., and during the first year of the war it was only 1.44 per cent. The Governor of Kiel has forbidden unqualified persons to advertise their willingness to treat the subjects of venereal disease. He has further decreed that women suspected of suffering from venereal disease are, as a rule, to be examined by medical officers, and in certain cases to be compulsorily treated in hospital. A conference of the German Evangelical Workman's Association has demanded the establishment of a public health office for combating venereal diseases, and that the regulation of prostitution and the brothel system in every form should be abolished.

PROFESSOR SULTAN (*Deut. med. Woch.*, June 15th, 1916) advises the more general use of giant electro-magnets. Before using electro-magnets on the living the author carried out a series of experiments with them on brains soon after death. He found this method of extraction the least harmful, for the electro-magnet pulled the splinters out in their long axis. Far less harm was, therefore, done to the brain than when it was probed with pincers or a finger. He gave cases to illustrate two points of interest. They showed (1) that all the tissues surrounding the metallic splinter were raised into a fold by the action of the magnet, and thus the position of the splinter was indicated. They also showed (2) that even when such a fold was not produced, and the splinter was not directly palpable in the wound, a vibration like that of a weak faradic current could be felt with the probing finger. By this vibration the position of the splinter could again be ascertained. He had never seen the slightest injury from the use of the giant electro-magnet.

THE report submitted to the monthly meeting of the committee of the Medical Sickness Annuity and Life Assurance Friendly Society on January 19th, when Dr. F. J. Allan was in the chair, showed that the society had experienced an exceptional number of claims during the last two months, arising from the epidemic of influenza. The claims were beginning to lessen. The total sickness experience for the year was under the expectation, in spite of a considerable sum having been paid for wounds, etc., to members on active service. It was decided to apply for a further £15,000 in the new Five per Cent. War Loan, and to convert the society's existing holdings, amounting

to £25,500. This transaction, when complete, will give the society a total of £40,500. The important question of the depreciation of stock values, which affects all insurance companies, was considered; a further £6,000 has been added to the investment reserve, raising it to £10,000. There is now no limit to the amount for which a member can insure, provided that such amount is not more than three-quarters of his average professional earnings, and advantage of this facility has been largely taken. At this meeting the chronic claims were reviewed and the advantages of insurance were well exemplified by these cases, which consist of men totally incapacitated from any work for the remainder of their lives, many of whom have stated that the amount received from the society is, in most cases, just sufficient to maintain themselves and families. For further particulars of the society apply to the Secretary, Medical Sickness and Accident Society, 300, High Holborn, London, W.C.

A MEETING of the Central Midwives Board was held on January 18th, Sir Francis Champneys presiding. The Standing Committee reported, amongst other correspondence, a letter from the Town Clerk of Middlesbrough enclosing a communication from the coroner, informing the medical officer of health that at an inquest on October 12th, 1916, on the body of a newborn child, the jury had added a rider to their verdict expressing their view that a midwife should not be allowed to notify as stillborn a child born before her arrival at the case where no registered medical practitioner had been in attendance at the time of birth. The Board has noted the suggestion for consideration on the next revision of the rules. In reply to a letter from the Colonial Office, transmitting an Ordinance to Amend the Midwives Ordinance, 1915, passed by the legislature of the Straits Settlements, it was decided to inform the Colonial Secretary that the new ordinance incorporated most of the amendments suggested on October 15th, 1915, but that the legislature of the Straits Settlements had not thought it desirable to omit the words "habitually and for gain" occurring in Section 14 (2) of the Ordinance of 1915. The presence of these words in Section 1 (2) of the Midwives Act, 1902, had been found productive of much difficulty in enforcing the provisions of the Act. It is hoped that an early opportunity may be found of amending the Midwives Act by the omission of these words. At a penal session on January 19th six women were struck off the roll. Among the charges were neglect of ophthalmia neonatorum and delay in recognizing abnormal presentations, and consequent delay in sending for medical aid. In one case the patient died and in the other the child was stillborn.

Letters, Notes, and Answers.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C., on receipt of proof.

THE telegraphic addresses of the BRITISH MEDICAL ASSOCIATION and JOURNAL are: (1) EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London;* telephone, 2631, Gerrard. (2) FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London;* telephone, 2630, Gerrard. (3) MEDICAL SECRETARY, *Medisecra, Westrand, London;* telephone, 2634, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin.

☞ *Queries, answers, and communications relating to subjects to which special departments of the* BRITISH MEDICAL JOURNAL *are devoted will be found under their respective headings.*

QUERIES.

INCOME TAX.

W. inquires whether, if his wife undertakes war work at such a distance from home that her remuneration is wholly, or partly, absorbed by the cost of her board and lodging, he will have to add her salary to his own for income tax purposes.

*** Strictly the cost of board and lodging in such cases cannot be claimed, but we understand that in the special circumstances the authorities allow a deduction not exceeding 2s. 6d. a day for the additional expenses of the worker's maintenance. If the total joint income of husband and wife does not exceed £500, separate "abatement" can be claimed in respect of the wife's earnings.

LETTERS, NOTES, ETC.

PRACTICES OF MEDICAL MEN DYING ON SERVICE.

V.A.D. writes: In all the schemes for the mobilization of the profession attempts have been made to conserve the practices of those away on military duty, but no attempt has been made in regard to the sale of the practices of those who have unfortunately fallen in the cause of their country. As this very often represents the sole capital of the dependants of the deceased officer, I think it of very great importance that steps should be taken to remedy this omission. It ought not to pass the wit of man to devise a suitable scheme for this purpose, and the General Medical Council ought to have penal powers in regard to such of those men who would reap pecuniary benefit from the losses of others who have died in the service of their country.

NICOTINE IN CIGARETTES.

M.D. writes: The reply to "M.R.C.S." in your issue of September 16th, 1916, p. 412, was read with great interest by me. I have attended a great many men who had lost their health and their means of livelihood from excessive nicotine poisoning, and now that women and children are taking to cigarette smoking in ever increasing numbers, I would like to make the patriotic inquiry whether cigarettes made from English tobacco from Virginian seed of which 80,000 lb. were grown last year by one farmer, would not be much less harmful. Your correspondent refers to your report in 1909, p. 911, which proved that Virginian tobacco when grown in Virginia contained the largest amount of nicotine, while it appears from the daily press that much of what are called Egyptian cigarettes are really Turkish.

I know for a fact that tobacco is grown in Canada by thousands of farmers for their own use as well as for the manufacturers which is generally known to pay them £40 an acre, and although this tobacco is grown from Virginian seed it is generally known to be much milder in nicotine than tobacco grown from the same seed in Virginia. This is easily explained by the difference in soil and climate. At Farnham, Surrey, the climate seems so suitable that I understand that the whole crop of the above-mentioned farmer was sold before it was ripe for picking. Tobacco growing is eminently suitable for women, and it would save the empire at least some of the tremendous efforts to keep up the United States exchange.

SUPPRESSION OF QUACKERY.

DR. DAVID ROBERTS (Swadlincote) writes with reference to the resolutions of the Council of the Royal College of Surgeons, published on p. 106 of the JOURNAL, January 20th: Why not go further? I contend that the general quackery practised by chemists is a danger to the community and should be included. Why do so many people resort to quackery? I think it is the dislike of examination and questions, arising from aversion to the decisive and downright, in the same sense as the "Iron Chancellor" objected to the thorough examination and questions of yet another of his new doctors; the reply he received was to the point: "You have made a mistake in calling me in; you ought to consult a veterinary surgeon, and he would not ask you any questions at all."

SUPERNUMERARY NIPPLES.

DR. W. H. PARKINSON (Assistant County Medical Officer of Health and School Medical Officer, Warwickshire) writes: Within the last few days I have met with a case of supernumerary nipple. The subject was a boy; the structure was situated on the left side immediately under the normal nipple and about 1½ in. lower down. It was very small, and there were no signs of a similar structure on the opposite side. While I have heard of the abnormality, I have never before seen a case, though I have examined, roughly, 20,000 children during the last four years in my capacity of school medical officer. I presume it is an instance of approximation to the type found in lower animals, owing to the usual suppression not having taken place.

*** Supernumerary nipples are said to be not very uncommon, and as many as eight in one case have been described. We find in *Anomalies and Curiosities of Medicine*, by Gould and Pyle, that Hirst states that "supernumerary breasts and nipples are more common than is generally supposed. Bruce found sixty instances in 3,956 persons examined (1.56 per cent.). Leichtenstern places the frequency at one in 500; both observers declare that men present the anomaly about twice as frequently as women." The fact that the accessory glands may develop at odd places on the body—on the shoulder, the axilla, the groin, or the thigh—has been held to make the theory of approximation to the type found in lower animals untenable.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

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NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.